AMERICAN
GAS JOURNAL
Established 1859 — Pioneer of the Gas Industry

VOL. 124. No. 21.
WHOLE No. 3207.

NEW YORK, SATURDAY, NOVEMBER 20, 1926.

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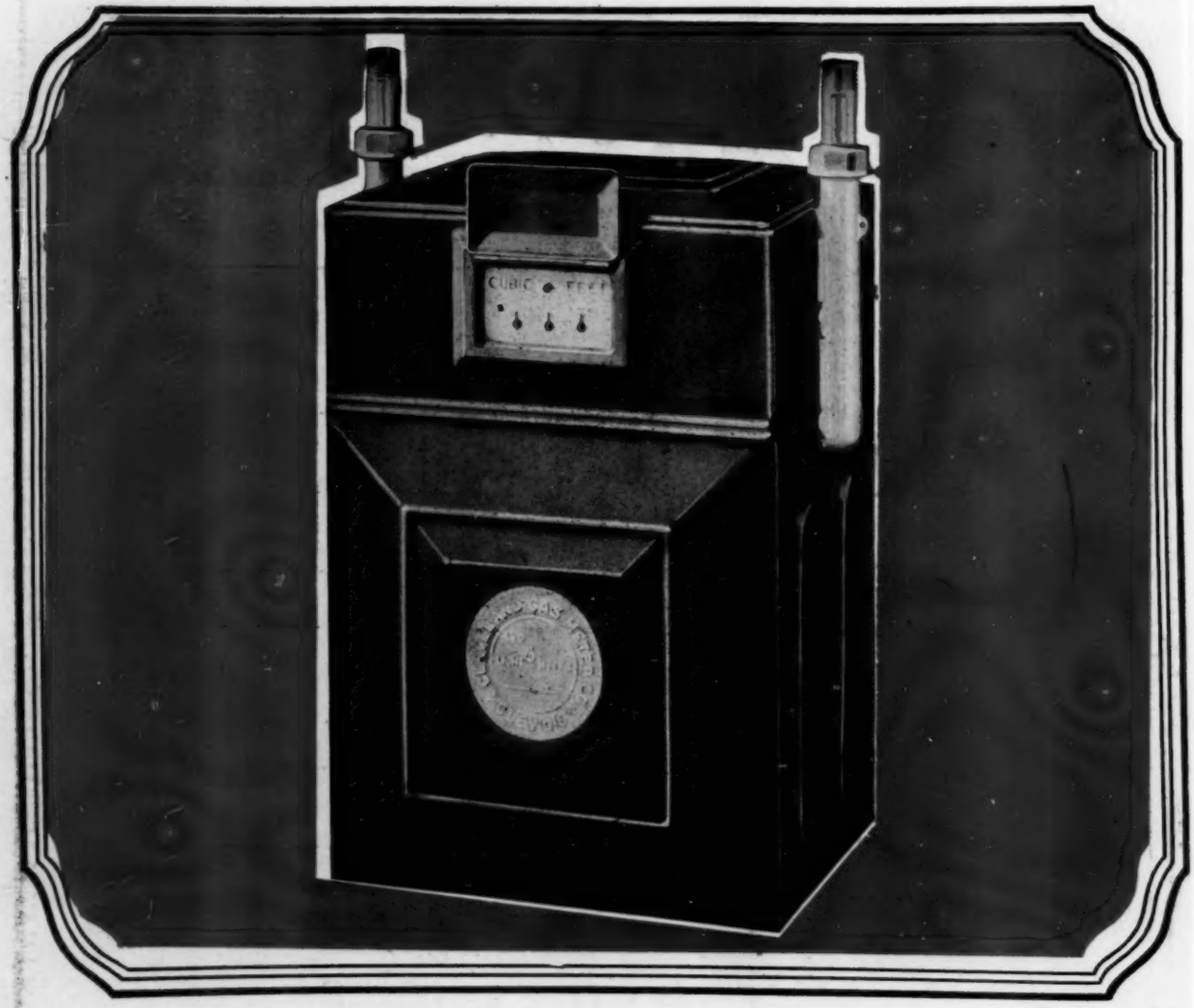

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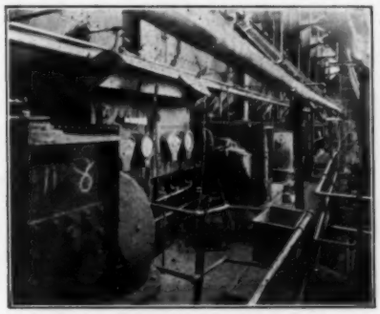

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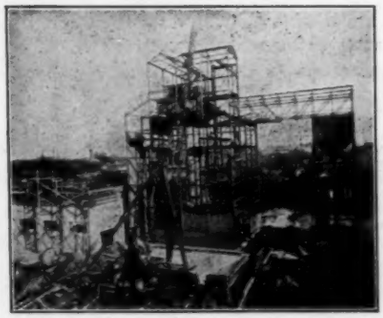

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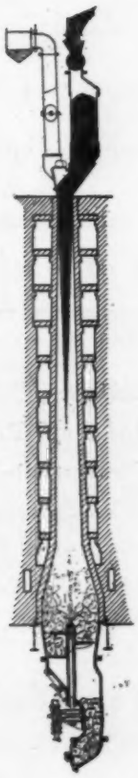

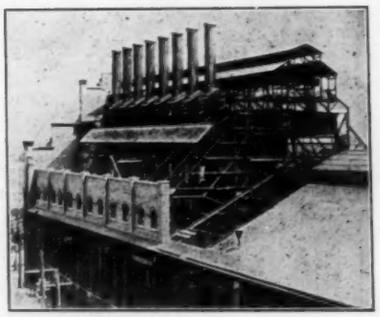

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STANTON G. KRAKE, Managing Editor ISMAR GINSBERG, Editor

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Subscription $3.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.

AMERICAN GAS JOURNAL, November 20, 1926. Vol. 125. No. 25.
Published weekly by American Gas Light Journal, Inc., New York, N. Y.
Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL

Established 1859— Pioneer of the Gas Industry

Vol. 125. No. 25. NEW YORK, NOVEMBER 20, 1926. Whole No. 3607.

Heating Water Sealed Gas Holders *

Considerable heat can be saved by efficient methods

Wallace L. Thackrey

Superintendent Gas Holders, Public Service Company of Colorado, Denver, Colorado

ANY gas man realizes the importance of keeping a holder from freezing, but the methods of doing so are of various types and efficiencies. When we stop to consider that the actual thermal value of the heat lost from our storage holders amounts to at least 2 per cent of the total annual B.t.u. output of our gas plant, regardless of the heating method used, we can realize that a little time spent in studying the problem is well worth while. If our system is only 50 per cent efficient, this figure would be 4 per cent or more, depending upon weather conditions and also upon the ratio of the storage capacity to the sendout. For Denver, with a ratio of approximately 23 per cent of storage capacity to a maximum day's sendout, the heat given up to the atmosphere from the water alone amounts to approximately 2 per cent of the annual B.t.u. value of the gas sendout.

Methods of Heating

In 1921, particular attention was directed upon this subject in Denver. Three different stations were equipped with different systems and comparative costs taken during the winter of 1921 and 1922. The holders were all of the 500 M. C. F. capacity, three lift type in steel tanks above the ground, therefore being similar in every respect. The three methods of heating were as follows:

Station No. 1. Using gas coke as fuel for generating steam.

Station No. 2. Using gas as fuel for generating steam.

Station No. 3. By circulation of the water in the holder tank and cups supplemented by gas-steam.

During the winter the thermal value of the fuel consumed at each station was:

Station No. 1 .....2,444,000,000 B.t.u.
Station No. 2 ..... 751,850,000 B.t.u.
Station No. 3 ..... 234,575,000 B.t.u.

The boiler at Station No. 2 was in use 30 per cent of the winter while that at No. 3 was used only 8 per cent of the time.

During the following summer all holders were equipped with systems similar to that at Station No. 3, and since that time several improvements in that system have taken place. Our latest installation used a total of only 28,000,000 B.t.u. (fuel only) during the winter of 1925-26, which is less than 12 per cent of that used at Station No. 3 during the winter of 1921-22. Incidentally, the boiler was in use only 1.4 per cent of the time in the five coldest months.

Description of Installation

At the holder on South Emerson street and East Arkansas avenue, the water is taken from near the riser pipes and about three feet below the surface, through a 4-inch pipe down through the bottom of the tank and to the suction side of the pump. The pump discharges into a 3-inch line which goes to the holder cups. In the 3-inch line are two sweep tees, which will divert a portion of the water through the boiler. In the boiler inlet and outlet are gate valves for regulating the flow through the boiler. There are five jets in each cup spaced equidistantly around the holder. In the top cup the jets are ½-inch in diameter. In the second cup the jets are ⅜-inch in diameter and in the pit for tank ¼-inch jets are used. The jets are made by using ½-inch nipple and capping it with drilled caps for the second cup and the pit.

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* This article was called forth by one that appeared in the October 12th issue of The American Gas Journal, written by P. C. Rodgers. The editor invites further comment.

During weather when the boiler is not needed the valves are shut. During the sunny part of warm days in the winter the pumps are kept running since we found that in a very short time we could heat the water effectually simply by circulating it when it could absorb heat from the sun.

Circulating Water Taken From Inside Lifts

The circulating water should be taken from inside the lifts. We found last winter that when the lower lift was landed there was as much as 15 degrees F. difference between the water outside the lift and that inside. At one holder where the circulating water was taken from near the water tank shell, the boiler had to be used almost continually during zero weather, while at this new holder where the water was taken from nearer the center of the tank the boiler had to be used very little and in the majority of cold spells was not needed at all.

Where the holder is already constructed it is possible to obtain the inner water through the use of a "U"-placed between the rest blocks as shown in figure 2. This can be let lown when the holder is full and then twisted through an angle of about 85 to 90 degrees to put the inlet inside the holder lifts.

Data

Following is a table of data for this holder:

1. Size of Holder:

(a) Capacity, M. C. F., 500; (b) Number of lifts, 3; (c) Number of cups, 2; (d) Diameter of tank, 93 feet; (e) Diameter of lower lift, 91.5 feet; (f) Diameter of second lift, 89.5 feet; (g) Diameter of top lift, 87.5 feet; (h) Depth of tank, 29 feet; (i) Depth of water in tank, 28.5 feet; (j) Depth of dirt fill around holder, 4 feet; (k) Depth of cup, 15 inches; (l) Width of cup, 8 inches; (m) Height of dam, 12 inches; (n) Pressure, 1 lift, 4.85 inches H_2O; (o) Pressure, 2 lifts, 8.25 inches H_2O; (p) Pressure, holder full, 11.18 inches H_2O; (q) Quantity of water in holder tank, 1,496,000 gals.

2. Square feet of radiating surface to which water is subjected (approx.):

(a) Area in direct contact with air, 730; (b) Are in direct contact with gas, 6780; (c) Area separated from air by steel, 7600; (d) Area separated from gas by steel, 1980.

3. Temperature of water under minimum air temperature conditions:

(a) In holder tank, 31 degrees F.; (b) In cups (approximately), 35 degrees F. The impurities of the water evidently decrease the freezing point. The lowest temperature ever noted in the cups was 33 degrees F. This was raised to about 35 degrees F. by a larger circulation through the boiler as per item 5.

4. Size, type, etc., of pump, boiler and connections:

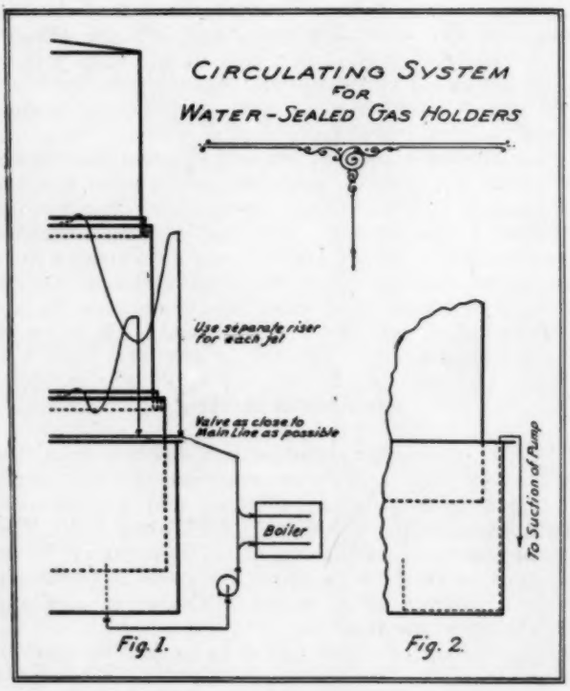
(a) Pump, 2½-inch type B. M. American Steam Pump Co. horizontal centrifugal pump. Cap., 200 G. P. M. 80 feet head; speed, 1750 R. P. M., direct connected with 10 horsepower, 1800 R. P. M., 220 Volt, 3 Phase, 60 Cycle G. E. Motor (with compensator). (b) Boiler, 21 section Bryant Boiler; (c) Connections: (1) Suction to pump, 4-inch; (2) Discharge line, 3-inch; (3) Line around holder, 2-inch; (4) Riser pipes, 1-inch; (5) Hose, 5 ply, 1-inch; (6) Jets, top cup, ½-inch nipple. Second cup, ½-inch nipple capped and drilled with ⅜-inch hole. Pit same except drilled ¼-inch; (7) Number of jets per cup, 5.

Amount of Water Circulated

5. Amount of water circulated with temperature rise in boiler:

In this item we have no reliable data on water flows but estimate that the amount of water circulated was approximately 220 gallons per minute.

Our experience indicates that unless a temperature of approximately 135 degrees is maintained in the boiler, the condensation from flue gases is very bad. Accordingly, the temperature of the water in the boiler was maintained at approximately 135 degrees F. by choking the outlet valve. This gave a temperature rise in the circulating water of approximately 8 degrees F.



When the inlet and outlet boiler valves were left wide open the temperature rise was approximately 10 degrees F. In the one case mentioned under item 3b, the temperature was increased by opening these valves. This could have been avoided by starting the boiler earlier.

6. Boiler consumption:

Tests on the boiler showed an hourly consumption of approximately 2200 cubic feet. If we assume an efficiency of 80 per cent, the heat put into the circulating water would be approximately 700,000 B.t.u.'s. This amount has been found sufficient for all conditions met with in Denver.

Radiation Losses

It is impossible to get accurate information regarding radiation losses. There are too many variables and unknown quantities, such as convection currents of water and gas. One item which is of considerable importance is that even when there is a small amount of radiation to the atmosphere there may be a compensating absorption of heat from the sun which at times is larger than the radiation loss.

The value of any information we have on radiation losses, therefore, is more or less questionable. However, that which we deem most valuable follows:

In order to reduce Weather Bureau statistics to a form which could be utilized, the number of degrees hours below 35 degrees F. are obtained for each month. 35 degrees F. was taken as the basis here because it was found that with air temperatures that low a hose near the top of the holder would sometimes freeze, thereby necessitating the starting of the circulating pump whenever the air thermometer reached that point. These figures follow for the last three winters:

Degree Hours Below 35 Degrees F.

	1923-24	1924-25	1925-26
October	1,078	4	1,469
November	988	1,084	1,335
December	6,124	10,098	5,230
January	6,839	5,454	4,829
February	2,482	1,033	1,504
March	6,481	1,509	3,028
April	931	2	777
Total	24,923	19,184	18,172

The average for the three winters is approximately 21,000 degree hours below 35 degrees F.

Thermometric Records

During the past year we have had thermometers to record temperatures of air and water. During the period of 108 days from October 16, 1925 to January 31, 1926, inclusive, there was a temperature drop in the water of approximately 17 degrees F. The weight of water in the holder was 12,450,000 lbs. The B.t.u. loss from the water was therefore 212,000,000 B.t.u. To this must be added the heat applied through the boiler. Assuming an efficiency of 80 per cent, this heat would be 22,500,000 B.t.u. so that the total loss from the water was approximately 235,000,000 B.t.u. During the same period there were 12,863 degree hours below 35 degrees F. The approximate loss per degree hour below 35 degrees F. was therefore 18,250 B.t.u. Similar figures over other periods (of shorter intervals, however) showed losses varying between 15,000 B.t.u. and 23,000 B.t.u. An error of a few tenths of a degree in reading water temperature, or the effect of direct sunshine, or its absence might be responsible for these variations. It is also true that the loss per degree per hour varies with wind velocities, differential temperatures, evaporation or relative humidity and many other variables. However, an assumption of 20,000 B.t.u. per hour per degree for this holder would probably not be far wrong.

Heat Radiation From Various Areas

To obtain some figures which could be applied to other holders is extremely difficult. However, for all multiple lift holders in steel tanks, there is probably a fairly definite relation between the various areas from which heat is radiated. There are several of these areas as follows:

1. Water in direct contact with air.
2. Water separated from air by steel.
3. Steel other than that in item 2 radiating to air heat conducted from the water.
4. Water in direct contact with gas.
5. Water separated from gas by steel.
6. Steel conducting heat from gas to air which had been absorbed from the water by the gas.

Of these the most important factors are the first two. Probably the others are so unimportant as compared with these two that the total loss could be expressed in terms of these two and thereby produce a figure of heat lost per unit area of these surfaces which could be fairly accurately applied to similar holders.

I am not satisfied with this deduction, but, at present, cannot see a better method for obtaining such a figure. For this particular holder the sum of these two areas is 8330 square feet. If we assume that all heat lost is from these areas then the unit loss would be 2.4 B.t.u. per square foot per degree hour.

Effect of Sunshine

Reference has been made to the effect of sunshine upon the holder. It was found that with the air and water temperatures the same there seemed to be heat absorbed by the water from the sunshine. This is explained by the Stefan-Boltzmann law of heat radiation. The effect of sunshine is seen in the temperature of a piece of steel lying in the sunshine. It is always much warmer than the air around it or the ground on which it lies. Where the water is in intimate contact with the steel on which the sun is brightly shining, there is a conduction of considerable heat to the water which at times more than compensates for the radiation loss of that part of the holder on which the sun is not shining.

Neglecting the effect of sunshine, the amount of heat picked up per hour per degree when the air is warmer than the water should be equal to that lost per hour per degree when the air is colder. The results of several tests indicate that on the average there is an absorption of 2.7 B.t.u. per square foot per

degree hour as compared with the 2.4 B.t.u. per square foot per degree hour for heat loss. The difference is the effect of the sunshine. It should be noted that this figure does not apply to that area in the sunshine but is to be used on the same basis as that for heat loss, that is, 2.7 B.t.u. per hour per square foot of water surface exposed direct to the air, plus the surface of water separated from air by steel.

Pumping Costs

Total K.w.h. Used During Season

Station	1923-24	1924-25	1925-26
1	11,223	13,833	12,946
2	14,325	14,328	15,997
3	11,539	....	17,609
4	....	14,813	15,749
5	....	16,788	15,708
Average	12,400	15,000	15,600

Heating of Water Sealed Gas Holders

During the past two seasons the pumps were run considerably during the warm weather, which accounts for the increased power consumption. At each station a certain amount of dependence is put upon the operator for the operation of the pumps. Wherever the human element enters in, there is bound to be some variation, which accounts for the difference in the various holders.

Miscellaneous

A few facts which may be of interest are:

1. Lowest temperature so far noted of water entering the circulating pump was 44 degrees F.

2. Lowest temperature of gas so far noted was 32 degrees F. We have not had a recording thermometer in the gas until this year. The temperature given above was taken with a mercury thermometer January 16, 1924. The thermometer was placed in a gas main some distance from the holder and indicated a temperature which was probably somewhat higher than that in the holder bell.

3. Highest temperature of water so far noted (in October) was 68 degrees F.

4. Highest temperature of gas so far noted was 78 degrees F. Since installing the recording thermometer in the gas line at the holder, the maximum difference between air and gas temperatures so far noted has been 16 degrees F. The usual difference indicates that the lag of the gas temperature behind the air temperature is only from 4 degrees to 6 degrees F. under average weather conditions.

5. Due to the fact that water is at its maximum density at about 39 degrees F., it is difficult to warm that portion of water which lies below the inlet of the suction pipe. In order, therefore, to obtain the maximum differential temperatures between water and air, on warming, through circulation, the top of the suction pipe should be just high enough to avoid the sediment in the bottom of the holder pit, probably 4 feet above the bottom of the pit.

The Heater

6. The heater used should be something which will resist the corrosive action of the water. The Bryant boiler used as a water heater is proving very satisfactory in our installation.

7. In case of a breakdown of the pump during cold weather, we are equipped at our holders to turn the city water directly into the circulation system. This serves the purpose except in extremely cold weather, but is expensive.

8. As far as practicable, all piping on the holder should be insulated.

9. All hose should be connected with unions or couplings so that they can be removed readily. The source of our greatest trouble is the hose. All too often the hose will freeze and must be taken down to thaw out or be replaced while thawing. It is always advisable to keep a spare on hand. Freezing is usually caused by the nozzle becoming clogged with a small bit of pipe scale or something of that nature.

10. The term "degree hours" used in this paper is not to be confused with that term as applied to house heating.

Conclusion

In conclusion, we might summarize as follows:

This particular holder lost during the last winter a total of approximately 365,000,000 B.t.u. Instead of the old inefficient methods used whereby the heat applied was from two to six times that amount, the actual B.t.u. consumption in the form of heat was 28,000,000 B.t.u., while the thermal value of the electricity used was 53,500,000 B.t.u., a total application of 81,500,000 B.t.u., or only about 22 per cent of the total lost. The other 78 per cent was supplied by the sun, a considerable portion of which was stored in the water during the summer months.

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TWENTY-ONE ADVENTUROUS NIGHTS

This is the title of a booklet that has been issued by the New York Edison Company, containing a series of twenty-one programs of music that are broadcasted every Tuesday night from station WRNY between eight and nine o'clock. The booklet is well arranged and attractive in that each program is given a name and the various numbers are described briefly.

The work that the Edison Company has been doing over the radio should be very interesting to the entire public utility industry. This certainly is a commendatory enterprise in building and maintaining the good-will of the public.

Gas in Non-Ferrous Metal Idnustry

Its use is compared with electricity--various furnaces described

R. S. Wile

Surface Combustion Company

GAS is practically new in brass melting. The electric furnace already has a big hold in New England in the rolling mills. It is being used particularly for yellow brass. The greatest objection to any type of electric furnace is the cost of power. The power companies quote rates based on the maximum demand for five or more minutes. This means that unless the furnace is operated twenty-four hours a day the current charge is bound to be high.

The main talking points of the electric furnace are quick melting, low loss and better metal. However, it usually takes around 250 to 275 KWH per ton of yellow brass, which means that at one cent per KWH the cost is more than $2.50 a ton.

The most prominent electric furnaces are the Ajax-Wyatt induction type and the Detroit Electric Rocking type. The induction type cannot be started with cold metal, so that an auxiliary means of melting must be included to prime the furnace before it can be operated. By allowing a small bath of hot metal to remain in the furnace over night and week-ends, cold metal may be added and melted, but the cost of power is considerable and it is considered better practice to drain the furnace and melt the priming charge in crucibles heated by other means than electricity. The induction type furnace uses a formed lining rather than a crucible and this lining not only has a comparatively short life but the forming of new linings is a slow, tedious and costly process, requiring anywhere from several weeks to months.

The Losses

The losses in this type of furnace are stated to be around one per cent, though the heavy incrustations of zinc oxide on the surface would make it appear that at times they are considerably more. The quality of the brass is good and it may be rolled and bent without danger of season cracking so prone to appear when the melting is done in crucibles by means of the old coal or coke firing methods.

Season cracking is that phenomenon which causes sheet brass after a time to crack in the direction opposite to that which it is rolled. This does not always take place at once but more often the brass has been in use for some time or seasoned, hence the name. This is entirely obviated if the brass is melted in the recuperative gas or oil fired furnace.

The arc type of furnace is not satisfactory for brass melting, since it has a number of disadvantages which have not yet been overcome. The electrical efficiency of the induction furnace is about fifty per cent and that of the arc furnace about eighty-five per cent.

The most popular crucible type furnace in use is the old fashioned pit type using hard coal or coke. This is the earliest type of brass melting furnace still in use.

Speed of Melting

The speed of melting depends on the vagaries of the weather, and the average heats for a nine-hour day is three. Recent tests have shown that the cost of fuel per pound of brass of a composition of 85 copper, 5 zinc, 5 tin and 5 lead is one-half cent per pound with hard coal at $14.50 a ton. Losses are sometimes as high as 8 per cent for yellow brass and 4 per cent for the composition just mentioned. Added to this are the losses caused by metal spilling into the ashes when charging and draining crucibles, and the loss of metal when the crucible breaks. The recovery of the metal from the ashes is expensive and this expense represents a loss on the recovered metal.

Pit furnaces of this type take up a lot of room, cause much heat in the foundry, require storage piles for coal or coke. Ashes must be hauled and stored, the oxidation of the zinc frequently causes spongy castings, resulting in season cracking. About the only advantage this type of furnace has is the prolonged life of the crucibles.

On account of its corrosive action and the rapid destruction of furnace linings oil is not a satisfactory fuel for brass melting. The crucible life is also very short.

Recuperative Gas Furnace Great Improvement

In the gas-fired furnace the metal can be drained off in case the crucible breaks and since it is not mixed with ashes can be used over again without going through any preliminary treatment. The greatest improvement in the gas furnace is the addition of recuperators. These heat the incoming air which reaches the burners pre-heated to about 1000 degrees. The number of heats is increased to seven or eight in the same period of time it takes the pit-fired furnace to melt three. Metal losses have been cut down 50 per cent and the cost of melting with gas at 85c per M is about one-fifth cent a pound. The crucible life is only slightly shorter than with the coal or coke-fired furnace.

The recuperative furnace as made for commercial purposes consists of two sections with three recuperators in each section. This makes a compact and neat installation and gives as much efficiency as is required for commercial practice. The pre-heat of air varies from 900 to 1000 degrees and the exhaust

gases leaving the recuperators are at a temperature of about 900 degrees and may be utilized in drying cores or for other useful purposes.

The melting time varies, taking 50 minutes the first heat, which usually requires something over 1½ hours. The gas consumption and the melting time when the furnace is cold are almost twice that when the furnace is hot.

The furnace is built with a large drain hole at the bottom, permitting the escape of any metal which may get into the furnace proper from broken crucibles or splashing and is so constructed that even if an entire crucible is broken the metal cannot get into the burner.

Gas for Galvanizing

One of the best fields for industrial gas is in the process of galvanizing. Sherardizing or dry galvanizing is comparatively new. To carry out the process, the articles are first cleaned by mechanical or chemical means, then placed in iron drums, cars or boxes with a quantity of commercial zinc dust. The work is then heated to a temperature at which zinc vaporizes, without melting. The result is a coating on the articles which is an alloy of about 90 per cent zinc and 10 per cent iron. Gas has been used successfully as a fuel for this work.

In the hot dip process which is the one most generally used, because it gives an excellent protection for a long period of time, the articles to be galvanized are pickled, that is placed in a weak solution of sulphuric and hydrochloric acids, to clean the surfaces thoroughly. They are then washed in water and dried. Just before galvanizing some articles are run through a sal-ammoniac solution which acts as a flux. The articles are then dipped into a bath of molten zinc at between 780° to 950° F. and kept immersed until it attains the same temperature as the zinc. When it is taken out it is shaken free of excess metal and cooled.

Temperature Control Important

Control of the temperature is of the greatest importance. If the molten metal is too hot, not only is there an excessive formation of dross, an alloy of zinc and iron which means a direct and heavy loss, but the coating of the parts immersed will run too thin, resulting in a product below the standard aimed at and frequently accompanied by a high percentage of wastage. Crystals will be small, on the other hand, if the bath is below the proper temperature and the coating will run too thick, resulting in a non-uniform and a direct loss of metal since only a given thickness of coating is necessary.

For every galvanizing operation only a narrow range of temperature is allowable, and the greatest possible care is necessary to keep this range. One set of experiments showed the following results:

Temperature in degrees Fahrenheit	820	840	860	880
Amount of dross found in lbs.	86	185	269	271
Relative amount of dross 86 equals unity	1	—2.15	—3.13	—3.15

These figures bring out the importance of working with temperatures as low as possible at the point where the heat is applied, and this can be done only with gas.

The proper application of gas-burning equipment to galvanizing results is in the reduction of the cost of production. In a plant in St. Louis production was increased 70 per cent because they were able to get positive and instantaneous temperature regulation. One gas pot at this plant does the work formerly done in two coke-fired pots. It is common today to reduce galvanizing dross 40 per cent when gas is properly applied.

Gas in Making Storage Batteries

Due to the rapid growth of the automobile industry and the use of radio vast numbers of storage batteries are manufactured. This develops into the use of gas in two fields, the first the manufacture of the battery and the second the reclaiming of the metals from the worn-out batteries. The making of the plates is a simple melting and casting problem. Worn plates come to the smelter without their cases but with the wet mud adhering to them, usually with the wooden spaces between them and other foreign material.

The blast furnace is the cheapest to use in reclaiming these plates but because of the fumes and sparks that result cannot be used in a built-up section. The ideal furnace is a rotary furnace fired with gas. The furnace is heated first, the charge is thrown in, and the furnace rotated. This causes the fluxes to melt at a very early period thereby covering the metal with a fairly impermeable cover. The waste gases are taken into recuperators which not only heats the incoming air but has the happy faculty of preventing dust discharges because the retarding of the flue gases and the cooling of them at the same time precipitates the dust.

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WATCH THAT DOMESTIC LOAD

IN these days of pre-digested breakfasts, help-yourself luncheons and delicatessen dinners, the gas man who wants to maintain his cooking load has to "plug" every head that bobs up and which undertakes to sell the home manager on the idea of eating out of the can. If this is not done we may wake up some fine morning and find that the stabilizer of the industry has wandered away from home and that the world's greatest purchasing agent is on a vacation in so far as gas fuel for home cooking purposes is concerned.

The way to overcome this feeling that prepared foods are better than home cooked foods is to keep everlastingly talking about home cooked foods, how much better they are and how easy they are to prepare on a modern gas range equipped with oven heat control. Talk, talk, talk, in person and in your newspaper advertisements about home cooked foods.

Gas Water Heating for Restaurants

How success was obtained under unfavorable conditions

John T. Laverty

Brockton Gas Light Co., Brockton, Mass.

WHEN the Y. W. C. A. cafeteria of Brockton opened it was equipped with gas for all cooking. Being located on the second floor made this necessary because the owners of the new building insisted on it.

A majority of the sponsors of the enterprise favored gas because of its cleanliness and other advantages but some feared the expense.

Two hotel units were installed, one with elevated broiler and the other with high shelf. A four shelf bake oven was also added.

When the dishwashing machine was installed the hot water supply proved adequate. This was furnished by the owners of the building from a 150 gallon storage tank heated by a special coal-fired boiler equipped with a blower. The cost for this unsatisfactory service was $40.00 per month. We were called to figure on a system for heating the water supply by gas and informed them that we could not compete with this figure but would guarantee plenty of hot water at an expense that would not be unreasonable, for the service rendered.

Gas Installation Made

After a year of experience with poor service we were finally given the order to install a 200 gallon copper boiler and No. 300 multicoil storage water heater. Although this was not separately metered, a comparison of cooking costs before and after installation gave $60.00 per month as the probable cost of hot water for all purposes. In addition to the large quantities required for dishwashing, this included what was needed for all other cleaning purposes at sinks, for floor washing and coffee urn use.

Under the able management of Mrs. Belle C. Ranson, who took charge of the cafeteria a few weeks after the opening, the patronage has steadily increased in spite of pessimistic predictions that it would be a losing venture because of location on the second floor and entire dependence upon gas for fuel. In fact, one restaurant man said, "I'll give them just six months, before they fail and go out of business."

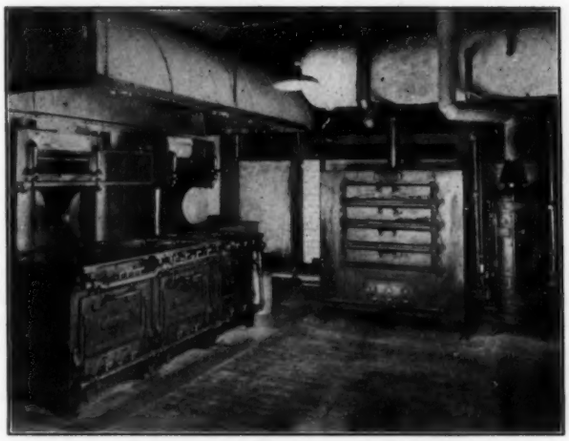
On the contrary, a comparison of 1924 business with that of 1923 shows that 17,244 more meals were served. This increase in business made necessary the purchase of another hotel unit with broiler last fall.

A Letter of Appreciation

The kind letter which she wrote was prompted by her satisfaction in the use of gas and appreciation of the service. Frequent inspection is given the equipment and any call for service received immediate attention.

The growth in patronage and addition to equipment has increased their gas consumption from 70,000 to 198,000 cubic feet per month and the bills are cheefully paid. An analysis of a recent month's gas bill showed that 14,164 meals were served at a cost of slightly over one and one third cents (.0138) per person. This cost includes all hot water used, the cooking of all meats, fish, vegetables, pastry, puddings, a considerable portion of the bread and rolls used, and the gas used under coffee urns and steam tables.

Mrs. Ranson is thoroughly sold on the "You can do it better with gas" idea and says that she would duplicate her present equipment if she opened another cafeteria tomorrow.



View Showing Gas Equipment In the Restaurant

The photographs of ranges and water heater shown in this article, with another showing Mrs. Ranson and her entire corps of employees, was mounted on a full sheet poster suitably lettered and displayed in our show window. Another full sheet card was an enlarged replica of her letter of recommendation. This letter was also featured in our newspaper advertising. We have many other all gas installations in local restaurants and are going after more.

Brockton Gas Light Co.
46 Centre Street,
Brockton, Mass.

Gentlemen:

We have found gas an ideal fuel in every way.

To see some of its accomplishments one need only to visit our cafeteria kitchen. There you will see one of the most complete gas equipments in New England. In addition to three units of hotel range and a large pastry oven, we have a two hundred gallon copper boiler heated by an automatic multicoil gas heater which supplies our hot water. The steam table and coffee urn are also operated by gas. In fact, we claim to have an all gas kitchen, which is wholly satisfactory.

The Brockton Gas Light Company has always given us prompt and efficient service.

The writer has had years of experience with other fuels and would not consider the use of anything other than gas.

Yours very truly,

Mrs. Belle C. Ranson,
Manager, Brockton Y. W. C. A. Cafeteria.

The Dehydration of Gas*

II. Details of compression and refrigeration systems

F. W. Sperr, Jr

THERE will doubtless be general agreement as to the advantages that can be obtained from the distribution of dehydrated gas. The principal questions that will be raised will be:

1. To what extent must dehydration be carried?
2. What methods for dehydration are available?
3. Can dehydration be accomplished at sufficiently low cost to justify its adoption?
4. Does dehydration involve any disadvantages outside of extra attention and operating cost?

Extent of Dehydration Required

It would be an unnecessarily expensive refinement to remove the last traces of moisture from gas in the dehydrating system. The essential point is that dehydration must be carried to a sufficient extent to prevent the deposition of liquid moisture anywhere in the distribution system. In most cities in the United States, dehydration to a dew point of 30° F. would be satisfactory and there are possibly some cases in the warmer parts of the country where a dew point of 38° F. to 40° F. would be satisfactory.

Consideration should, however, be given to what has been said about the "dry corrosion" that might be produced through the deposition of small amounts of moisture from gas which is unsaturated, but near its saturation point. In the writer's opinion, if the dew point is maintained at 30° F., or less, the possibility of this dry corrosion need cause no serious concern, especially if the system be kept lubricated by injecting a condensible oil in the form of a fog or a vapor. The amount of moisture deposited in the so-called invisible film on a bare metal surface would be extremely small even at temperatures near the dew point, and at such low temperatures any corrosive reactions would be very slow. They would doubtless be prevented altogether if the metal were afforded the protection of an oil film.

Bases of Calculations

Figure 1 shows the amount of water in pounds per thousand cubic feet of gas measured at standard conditions (60° F. and 30" Hg.) and heated or cooled and saturated with water at various temperatures. The second curve on this figure shows the weight of water removed from saturated gas when cooled from various temperatures to 30° F. In this and subsequent figures and calculations the basis will always be one thousand cubic feet of saturated gas measured at 60° F. and 30" Hg. For example, on Curve I in Figure 1, it is shown that gas at 85° F. contains 2.0 pounds of water per thousand cubic feet. This means that one thousand cubic feet of saturated gas measured at 60° F. and 30" Hg. and heated to 85° F. and saturated again requires a total of 2.0 pounds of water for saturation. The actual volume of the saturated gas at 85° F. would, of course, be much greater than one thousand cubic feet and would in fact amount to 1,073 cubic feet.

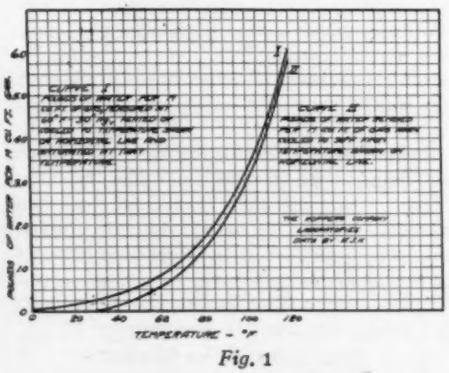


Fig. 1

Figures 2 and 3 apply to the distribution of dehydrated gas at pressures higher than atmospheric. The higher the distribution pressure the greater is the amount of dehydration required. For example, if gas transmitted at 20 pounds pressure be required to have a dew point not exceeding 30° F. at that pressure, it must be dehydrated to a dew point equivalent to 12° F. at atmospheric pressure (Figure 2).

Methods for the Dehydration of Gas

The methods available for the removal of moisture from gas may be classified as follows:

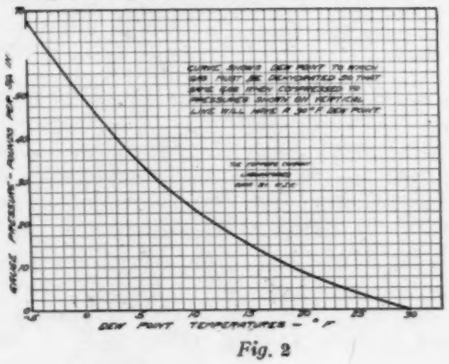


Fig. 2

1. Compression.
2. Refrigeration.
3. Treatment with hygroscopic substances.
4. Treatment with adsorbents.

Partial drying of manufactured gas by compression has already been recommended and practiced.

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* Second installment of Mr. Sperr's article, commenced in the November 13th issue.

Dehydration by refrigeration or by treatment with hygroscopic substances or adsorbents has not yet been practiced in the manufactured gas industry, but has been applied in one form or another on a very large scale in the drying of air for blast furnaces.

Various modifications and combinations of the principal methods afford a large number of possible systems. In the following discussion, no attempt will be made to cover all of these possibilities, but some of the more promising ones will be described,

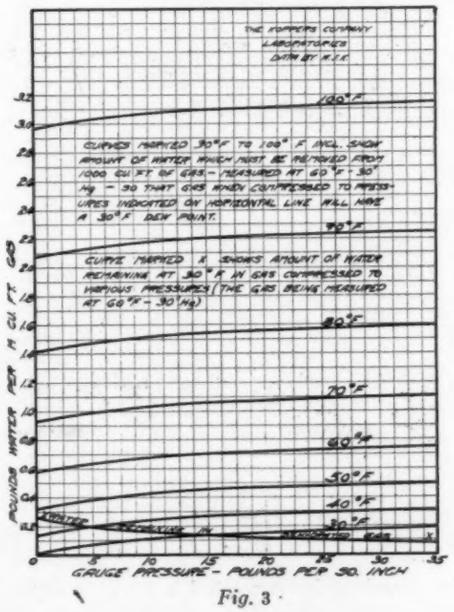

THE ROBERTS COMPANY
LABORATORIES
DATA AT N.Y.C.
100°F.
90°F.
80°F.
70°F.
60°F.
50°F.
40°F.
30°F.
CURVES MARKED 30°F. TO 100° F. INCL. SHOW AMOUNT OF WATER WHICH MUST BE REMOVED FROM 1000 CU. FT. OF GAS - MEASURED AT 60°F - 30" Hg - SO THAT GAS WHEN COMPRESSED TO PRESSURES INDICATED ON HORIZONTAL LINE WILL HAVE A 30°F. DEW POINT.
CURVE MARKED A SHOWS AMOUNT OF WATER REMAINING AT 30°F IN GAS COMPRESSED TO VARIOUS PRESSURES (THE GAS BEING MEASURED AT 60°F - 30" Hg)
POUNDS WATER PER M CU. FT. GAS
GAUGE PRESSURE - POUNDS PER SQ. INCH

Fig. 3

and some of these will be illustrated by flow sheets which must be understood to be diagrammatic and not in any sense representative of the relative sizes and actual arrangements of the apparatus.

Dehydration By Compression

Reference has already been made to systems already in existence for the removal of moisture by compression. The method is really one of compression and cooling, and it is essential that the gas should pass into the distribution system at a much lower pressure than that at which the gas is cooled, so that it may be below its saturation point under every condition. High pressure gas saturated with water vapor offers disadvantages similar to those pertaining to the distribution of low pressure saturated gas, and even intensified owing to the greater concentration of corrosive impurities.

The flow sheet for a compression and cooling system is shown in Figure 4. The pressure to which gas must be compressed to produce the necessary amount of dehydration depends upon the final dew point and pressure required for the gas entering the distributing system and upon the temperature of the cooling water available. Assuming a final dew point of 30° F., Figure 5 shows the pressure required at different temperatures and final pressures. Taking the case of the American Light and Traction Company's system previously referred to, with a maximum compression of 80 pounds and a distributing pressure of 5 pounds, it will be seen from Figure 5 that so long as such gas is cooled to 71° F. or less, a dew point not exceeding 30° F. can be maintained. In the other examples, with a compression of 50 pounds and a distribution pressure of 5 pounds, the cooling temperature would have to be very nearly 60° F. to maintain the same dew point.

Power Requirements

Within ordinary limits, the power required for removal of moisture by compression depends upon the temperature of the cooling water available and is nearly independent of the final pressure to which the gas is expanded after compression and cooling. In other words, that portion of the theoretical power cost for compression which is chargeable to dehydration and not to transmission is practically about the same, irrespective of whether the gas is transmitted at 5 pounds or at 25 pounds pressure. Under most conditions, the method is an expensive one on account of the high power cost. The advantages are principally those of simplicity and convenience. Figure 6 shows the theoretical power required at different temperatures for dehydration to a dew point of 30° F. The curve is based on isothermal compression and thus represents the theoretical minimum power in each case.

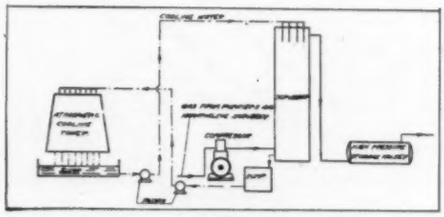


Fig. 4

In practice, the maximum economy would be gained by multi-stage compression with intermediate cooling between stages, but this would have to be balanced against the possibly increased cost of equipment. There is a further possibility of economy in utilizing the cooling effect obtained when the compressed gas is expanded, or in utilizing such expansion as a source of power. The latter method is described in a patent assigned to the Allis Chalmers Manufacturing Company.[11].

Effects Produced By Compression and Cooling System

A compression and cooling system would, in many cases, have the effect of reducing the heating value of the gas through the removal of light oils. The net effect would depend on the initial light oil content of the gas. In the experience of the Pacific Gas and

[11] J. F. M. Patitz, Gas Desiccation by Compression, Cooling, etc., U. S. Patent No. 1,113,682, Oct. 13, 1914.

Electric Company, described by R. S. Fuller,[12] the average B.t.u. drop through transmission systems 23 to 25 miles long, with initial pressures of 55 to 60 pounds, is only 3 to 5 B.t.u., but the content of condensible oils in California oil gas is lower than in the average coal gas or water gas of the same heating value, and the temperature conditions in California are also favorable to the retention of a larger amount of light oil in the gas than would be the case in most Eastern systems. The loss of heating value in the high pressure transmission system of the Western United Corporation for carburetted water gas has been as much as 35 B.t.u. or 6 per cent of the heating value of the gas, the initial pressure being 75 pounds.[13]. In the system of the American Light and Traction Company referred to above, the loss is about 3 per cent.

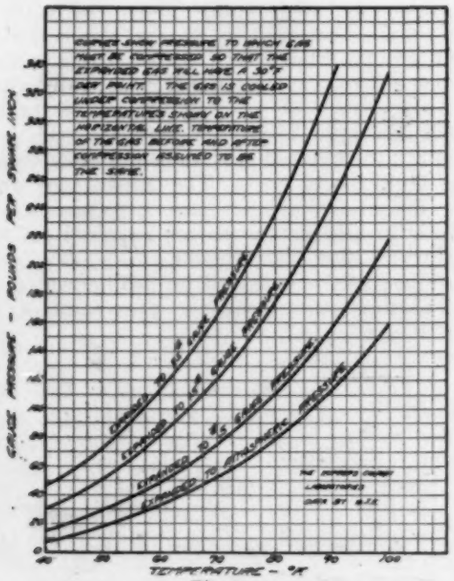


Fig. 5

In addition to removing more or less light oil, the compression and cooling system would also remove naphthalene, and this substance would go out with the cooling water from which it could be separated by means similar to those employed in the final cooler systems of by-product coke plants. With gases of relatively low heating value, which would produce little or no light oil condensates in the system, such a system might, therefore, serve the twofold purpose of dehydration and naphthalene removal because the subsequently expanded gas would be well below the naphthalene dew point under conditions of distribution. Where any light oil condensate is formed, however, the efficient separation of this, along with the deposited naphthalene from the relatively large volumes of cooling water would be a very difficult matter. In such cases, it would appear best to employ a naphthalene scrubber and operate this in such a way as to remove sufficient light oil so that no condensation would be produced in the dehydrating system. This would permit of the efficient recovery of both the light oil and naphthalene and would simplify the cooling water circulation system in the dehydration plant.

[12] R. S. Fuller, High Pressure Gas Transmission and Distribution, A. G. A. Proceedings, 1924, p. 908.

[13] W. A. Dunkley, Amer. Gas Jour., Mar. 24, 1923, p. 239.

Dehydration By Refrigeration

In the development of the dry blast process for blast furnace operation, James Gayley,[14] of the U. S.

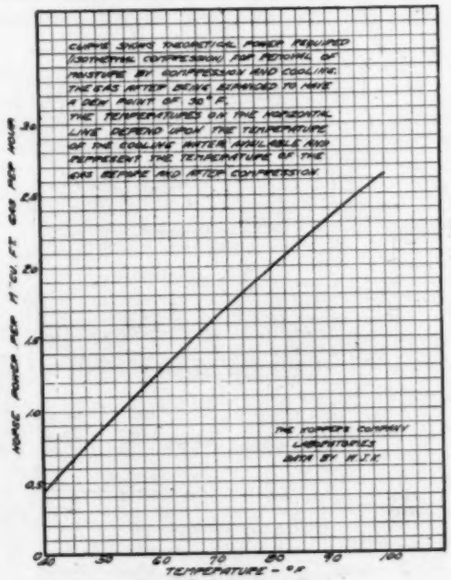


Fig. 6

Steel Corporation, investigated a great many different methods for extracting moisture from the air and finally selected the method of direct refrigeration in which the air was passed through a chamber filled with pipe coils through which brine from an ammonia refrigerating plant was circulated. The moisture was deposited on the coils and, of course, had to be thawed off periodically by pumping warm brine through this apparatus. The air was thus dehydrated on the suction side of the blowing engines. In later years, the system of cooling the compressed air by direct contact with a "rain" cooled by the refrigerating coils was introduced. This system was worked out and applied by the Carrier Air Conditioning Company of America and is described in Chapter 10 of "Blast Furnace Construction in America" by J. E. Johnson, Jr., which contains the best general information on the dry blast. Unfortunately for our present purposes, the development of the dry blast process has languished, not because of any inherent difficulties, but because the technical progress and different economic conditions in blast

[14] James Gayley, The Application of Dry Air Blast to the Manufacture of Iron, Trans. of the Amer. Inst. of Min. Eng., vol. 35 (1904), p. 746. Probably the best summary of information on the dry blast in blast furnace practice since the publication of Mr. Gayley's paper is contained in Chapter 10 "Blast Furnace Construction in America" by J. E. Johnson, Jr., McGraw-Hill Book Company, New York. 1917.

furnace practice eventually rendered the dry blast unnecessary, except possibly under certain special circumstances. There are now very few such plants in operation and the art of dehydrating vast volumes of air has not undergone the improvement that would certainly have resulted if the process had lived up to early expectations.

Air Conditioning

The drying of air by refrigeration is now practiced on a smaller scale in the art of conditioning air for various purposes. Partial dehydration is accomplished by refrigerating plants operating in connection with the ventilating systems of theatres and other public buildings. In the majority of cases, however, a dew point of 40° F. or higher is satisfactory. This is attained by treating the air with sprays of water cooled in refrigerating apparatus. It is feasible to cool water in a refrigerating plant to a temperature of 34° to 35° F. and, with such water, dehydration of air or gas may be accomplished in a single stage apparatus to a dew point of approximately 35° to 40° F.

The general subject of refrigeration has been well covered in the 1925 Proceedings of the American Gas Association.[15] The possible application of the absorption system would be of special interest to gas engineers; but, so far as the writer is aware, nothing of this sort has been done in connection with industrial dehydration. Until recent years, the standard type of refrigerating apparatus used in air conditioning operations has been a simple modification of the familiar ice machine operated with anhydrous ammonia.

[15] Refrigeration, A. G. A. Proceedings, 1925, p. 521.

Selling for the Gas Business*

An analysis of the merchandizing problem

Oscar H. Fogg

Vice-president, Consolidated Gas Co., New York City.

WHY are we in the gas business engaged in the merchandising of appliance accessories? Several years ago that question was asked of about a dozen of our best successful and most progressive commercial men from as many different sections of the country. I asked them if they would not think that thing out for a little while and present their answers. Their answers, summed up as a composite or what might be called a weighted average of opinions (there was some variation in the individual replies but treating them as a whole) were as follows: The first and most important reason was to promote the sale of gas, and the last and least important was for the sake of the profit to be derived from the sale of appliances. Now, between those two reasons were many others, or a number of others, such as to improve customer relations and promote good-will; to insure the satisfactory use of gas by providing an efficient appliance at a reasonable price; and others which I shall not enumerate now.

The important thing that that brought out was that no one failed to recognize and emphasize the fact that our basic reason for being in a merchandising business was to promote the sale of gas. Every phase of our sales effort should have that fact as its clear objective, to be kept at all times vividly in front of our minds. We will also do well to remind ourselves frequently of one of the outstanding particulars in which our entire sales theory is fundamentally different from most others.

Completed Sale Not End of Transaction

As a rule in merchandising transactions, the objective has been achieved when the sale is consummated. The buyer then ceases to be a prospect until the lapse of time he develops either a new or replacement demand. Now, so far as the sale of appliances is concerned, that rule does not apply to us only in part, and it applies not at all as for the sale of gas service. Once we put the added use of gas on our books, we expect and hope to keep it there definitely as a daily, uninterrupted source of revenue. So in selling from the public utility's standpoint, we are really selling for the future development of our utility service.

I know that that seems a rather elementary consideration to present to such a body as this. Yet there have been observed, sales activities which appear to have as their prime objective, the merchandise turnover, with insufficient regard for the direct influence that this had upon the development of gas sales. Indeed, there have been observed some extreme cases or such extreme cases as gas company merchandising goods for use far beyond its own

* Delivered at the Gloucester Sales Conference.

(Continued on page 614)

Generating Hydrogen Sulphide

New method for producing the gas for the fouling test

A. F. Kunberger

Chief Chemist, The U. G. I. Contracting Company

THE nuisance connected with cleaning the Kipp generator when used for producing sulphide along with other disadvantages has lead the writer to find another means of producing hydrogen sulphide.

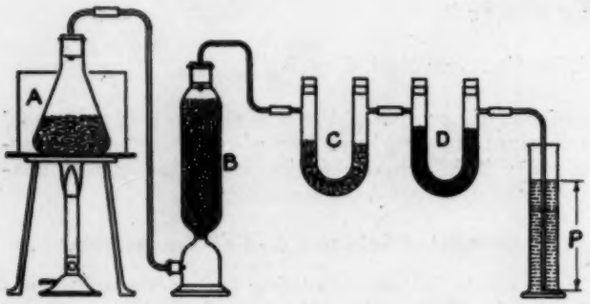
There is today available a material which may be used in place of the iron sulphide acid generator and fouling tests made gave such satisfactory results that we feel a short description should be of general interest.

The material, known as Aitchtuess, used for the generation of the H_2S is an intimate mixture of paraffin wax, sulfur and fine asbestos. The reaction is as follows:

$$CnH_2n + 2 + (n + 1)S = nC + (n + 1)\,H_2S.$$

The asbestos serves as a support for the reactants and a filter for the gas.

Immediately following the application of heat from bunsen flame the generation of gas starts and continues with a uniform flow. When it is desired to stop the evolution of gas the heat is withdrawn. The gas ceases to be evolved very promptly, and may be started again upon application of the flame.



The Hydrogen Sulphide Generating Apparatus

The Apparatus

The apparatus employed is shown in the following sketch.

A, the generator, is a pyrex erlenmeyer flask of about 250 cc. capacity containing from 50 to 100 grams Aitchtuess. This amount of material will supply H_2S gas sufficient for from eight to sixteen foulings of 60 minutes duration and will require no attention other than the application of the flame.

This flask is placed in an inverted metal box (tin box), the neck projecting through hole as shown in figure, and resting on an asbestos board.

When the material has been exhausted, the residue of asbestos and carbon is easily removed and discarded preparatory to introduction of a new charge.

This flask A is connected with the tower B which communicates with the U tubes C and D. The exit tube from D passes into a cylinder of water and the depth of the water is adjusted to give the pressure desired (4 inches or more).

Advantages Gained

The advantages accruing from this generator are convenience, capacity and freedom from odor.

It can be used in the open laboratory without creating any nuisance as there is no need for escape of H_2S gas.

We are also assured that the pressure registered is the pressure of H_2S and not the pressure of a mixture of H_2S and Hydrogen as is the case with the conventional FeS generator due to the presence of Iron as an impurity in the FeS, and of eliminating errors, due to an excessive amount of hydrogen in the H_2S produced.

In addition, there is no sweep of inert gas (H_2) through the U tube C, therefore, no water is carried into U tube D thus making frequent renewal of the $CaCl_2$ in D unnecessary.

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COMFORT OF VISITORS AT "SESQUI" PROVIDED BY USE OF GAS FOR ALL HEATING

Gas is playing a big part in ministering to the comfort and convenience of visitors to the Sesqui-Centennial exposition in Philadelphia, says the New Jersey Public Utility Information Committee. Gas is doing a big job, and doing it quietly and efficiently day after day. It has been "on the job" since May 29, two days before the exposition formally was opened.

Gas is the exposition's fuel for cooking, for heating of buildings, and for heating water. It is cooking meals served at the largest and many of the smallest cafes and restaurants within the grounds. It is cooking millions of "hot dogs" and "barbecue" sandwiches.

Even greater accomplishment to the credit of gas as a fuel is the heating of the thousands of gallons of water needed every day. Twenty-two buildings at the exposition are served with hot water heated by forty-one automatic gas water heaters.

Gas is washing dishes at all the restaurants; it is making millions of cups of coffee; it is providing hot water to keep the booths and buildings clean; it is providing hot baths for tired attendants in booths; and it is furnishing hot showers for the hundreds of athletes who participate in the various events held in the stadium. Gas is saving time, labor and expense at the Sesqui just as it is doing in thousands of American homes.

As The Journal Views It

THE NEED FOR TRAINED MEN

The public utility industry with its many ramifications, its numerous problems of technical, industrial, financial and other character, imperatively requires trained men. This industry is a very complicated one and this refers particularly to the gas business and its need for a trained personnel is becoming more and more accentuated. The gas industry, like the other utility industries, has had to develop its own personnel to a certain extent and is still doing so. Thus, large gas companies are today spending considerable time and money in training men to occupy important positions in their organizations. However, they should and must have the co-operation of the educational institutions of the country, for no other reason than that there is no more important field, as far as the welfare of the general public is concerned, than the utility field.

Educational institutions have recognized to a certain extent the need of the public utility industry for trained men, and this recognition will increase in the near future. It should not be long before these institutions give as much attention to the public utility industry as they have been giving to such industries as steel and agriculture, which have long been the subject of scholastic study. It is true, however, that the public utility industry has advanced with such broad strides that the educational facilities have lagged behind.

One important circumstance in this work is the fact that the needs of the public utility in educational work have been well defined. The institutions of learning now know just where to lay stress in their curricula devoted to public utility instruction. There is no question that the matter is a complicated one in that the educational institutions are called upon not only to train men in technical subjects that are of importance to the gas and other utility industries but also to train them in such matters as finance, management, public relations, accounting and the like. Up to date considerable attention has been given by various universities to all these subjects. Courses in public utility economics and management as well as on the manufacture and utilization of gas and other technical subjects have been offered.

But additional attention to this matter is required. This work should go on and should be increased rapidly. There is room in the public utility for the properly trained man for the industry is rapidly progressing, entering new fields and encountering all sorts of difficult problems whose solution is the task of those who have prepared themselves by study and application for this work.

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INDUSTRIAL DEVELOPMENTS POINT TO GREATER BUSINESS

It has often been said that the gas company is reaching a position where it has to depend more than ever on its industrial load for increased business. This does not mean that developments are not taking place in the domestic load as well, but after all, an industrial customer can use gas of sufficient amount to counter-balance the consumption of quite a few domestic customers.

It has often been held that the more industrial business the gas company gets, the more it loses its former monopolistic character and the more it becomes subject to general business conditions and the factors that influence the business of the country.

R. B. Brown, vice-president and general manager of the Milwaukee Gas Light Company, looks for good business ahead for gas in the 1927 season, and aptly says that expectations for increased business will materialize except if there is a decided industrial slump in the country. This viewpoint of a prominent gas man regarding the business of the gas industry is a clear indication of the importance that is being laid by gas men on the industrial load and on the connection between the gas industry and general business conditions in the country. Mr. Brown has the following to say:

"The development of heating business, of new and more successful applications to industrial problems, the very probable further increase in the price of oil, our expectation that we will have very successful and very economical household refrigeration units to be operated on gas ready for exploitation in the

season of 1927, all lead us to believe that additional business with present customers—industrial, commercial and domestic—will keep us very busy in 1927. Any disastrous slump in industrial conditions might, of course, offset this, but we do not see anything definitely indicating such a situation at this time."

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SELLING FOR THE GAS BUSINESS

(Continued from page 611)

territory and presenting the result of that activity as an evidence of efficient salesmanship.

Sale of Service Fundamental

My chief reason for touching upon this subject is to endeavor to emphasize what has been said so many times, that all of our sales activities should hew to the line of developing the sales of gas service. I do not share the view occasionally expressed that the utility company should merchandise nothing but gas-consuming equipment, but one can urge that all goods merchandised should add to the convenience and hence to the value of the utility service and so contribute to its increased use.

The statistics of your Association, the A. G. A., show that the average sale of gas per customer increased from 35,066 cu ft in 1920 to 39,780 cu. ft. in 1925—an average annual growth per customer of about 2 1/3 per cent. Our annual sales per customer, taking them with due consideration for any unusual conditions that may influence the result between one year and another, are the true index of our commercial progress and the efficiency or lack of it in our sales organizations, and can only be measured by that yard stick.

Sales Opportunities

Now, while it had not been my intention to touch upon selling methods at all, because I recognize that as the field of the specialist, it may be in order to venture a general word on the opportunities that await us in the application of gas to industrial uses. No opportunity waits over long and we should not let the delay involved in the preparation of elaborate plans or campaigns needlessly permit any of this valuable business to escape.

One of the first things needed to approach industrial customers intelligently is to determine the possible use of gas within a particular industry and its specific application in the prospective customer's plant. The last information of course, is to be secured only by a direct investigation. With a small company, a complete survey of the entire community is desirable. In the case of the larger property, such an undertaking may, and usually does, involve many men and much time and actual sales effort should not be delayed or held back for its completion.

Segregating Industries

Practical considerations suggest the desirability of segregating each industry, studying its possibilities and then concentrating the effort upon these separate industries one at a time in the order of their attractiveness as possible users of gas service. Thus we would have what might be called a progressive survey, co-ordinated with a selling effort, and with our objectives clearly defined and set before us in the order of their relative importance to us as possible uses of industrial gas.

Now, the work of the A. G. A.'s Industrial Section in dealing with the fuel requirements of and the application of gas fuel to specific industries, gives most effective aid to this procedure and enables us to go forward with a well-ordered plan of localized attack instead of biting off pieces of the industrial business at random. As one attends the conferences and meetings of men in our business, he hears a great deal about compensation of other sources of heat. It is important that we should be prompt to recognize these possibilities, to analyze them and strengthen our front to meet them. But there is another sort of competition within our ranks that we should do well to stamp out.

Competing With Ourselves

What can justify the utility company in the expenditure of time, money and sales energy in an effort to outsell the dealer or manufacturer or reputable approved appliances for use in the same territory? What can justify any system of sales compensation that pays a commission or salary to men for wresting business away from a dealer or manufacturer who offers to the prospective user of gas service, appliances which are efficient, satisfactory and reasonable in price? This, as I see it, is nothing less than competing with ourselves. And in addition to its fruitlessness it can serve only to clog the avenues of distribution to the public.

This business of ours has too few tributaries as it is. We should be doing all we possibly can to develop new and wider channels of distribution. The only competition that can be justified is that the purpose of which is to defeat the sale of unfit or inferior appliances by those who have no concern in upholding the character of the service which the utility company desires to render.

The dealer or manufacturer offering approved appliances at a reasonable price, should have our enthusiastic encouragement, our practical assistance and support. Unless our merchandising practices are shaped by clear visions and liberal policy, there is the danger that they may tend more and more to restrict to the utility company the sale of gas using equipment. Our situation seems to call for a serious effort to develop and utilize every legitimate agency possible for putting into the hands of the people the appliances which will promote the use of goods in their factories, shops and homes.

(Continued on page 616)

INDUSTRIAL GAS LESSONS

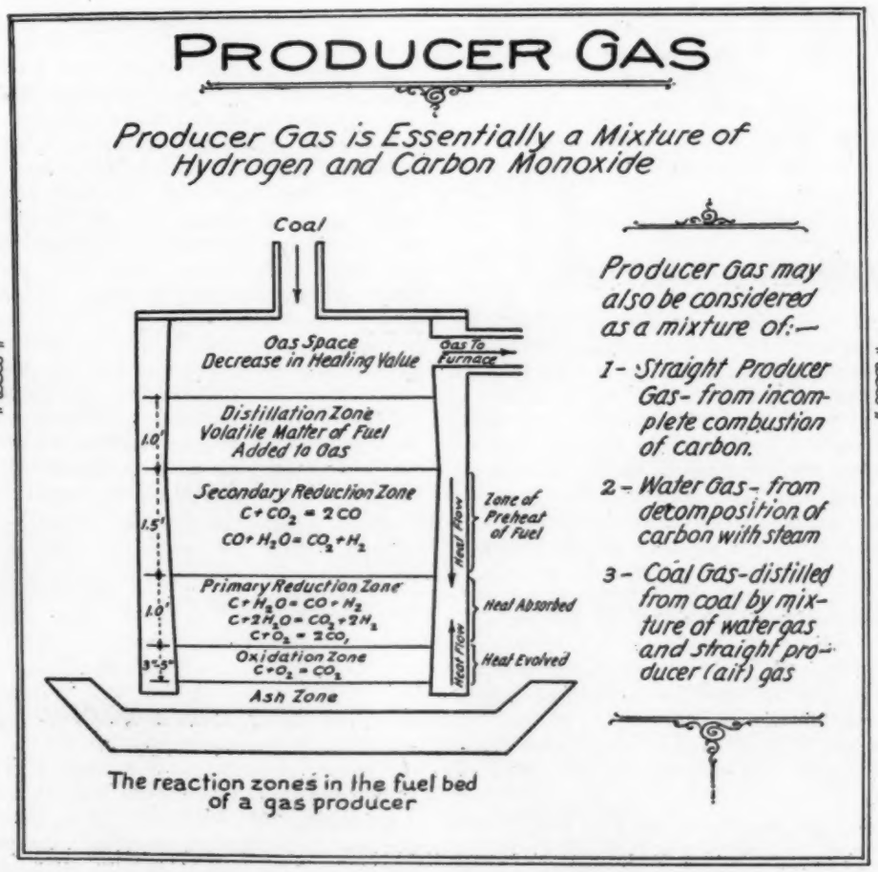
IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 144

Manufactured Gas

Producer Gas

Producer gas is perhaps the simplest of all the gaseous fuels. At any rate its manufacture involves less difficulty than the remaining fuels in this category. It is also customary to mix some steam with the air for special operating purposes. In other words, producer gas may be held to be a partially burned coal or coke. Complete combustion of the carbon and the hydrogen in the solid fuel would result in the formation of a flue gas containing carbon monoxide, water vapor and the nitrogen originally contained in the air used for combustion. This sort of gas would be absolutely non-combustible. However, when the burning of the coal is carried out under the conditions that afford an insufficient supply of air to result in complete combustion, a gas is obtained which contains a certain proportion


PRODUCER GAS
Producer Gas is Essentially a Mixture of Hydrogen and Carbon Monoxide
Coal
Gas Space
Decrease in Heating Value
Gas To Furnace
Distillation Zone
Volatile Matter of Fuel Added to Gas
Secondary Reduction Zone
C + CO2 = 2 CO
CO + H2O = CO2 + H2
Primary Reduction Zone
C + H2O = CO + H2
C + 2H2O = CO2 + 2H2
C + O2 = 2CO
Oxidation Zone
C + O2 = CO2
Ash Zone
1.0'
1.5'
1.0'
3"-6"
Heat Flow
Zone of Preheat of Fuel
Heat Absorbed
Heat Evolved
Producer Gas may also be considered as a mixture of:—
1- Straight Producer Gas- from incomplete combustion of carbon.
2- Water Gas- from decomposition of carbon with steam
3- Coal Gas-distilled from coal by mixture of water gas and straight producer (air) gas
The reaction zones in the fuel bed of a gas producer

of combustible ingredients. And when this process is carried out in a producer, under well-defined and regulated conditions, the gas, known as producer gas, is obtained.

Producer gas is therefore a gas that contains the products of the incomplete combustion of coal, principally carbon monoxide and hydrogen. It has been mentioned that gas is made in a producer. A diagrammatic sketch of this machine accompanies this lesson. It is seen from this figure that the coal is fed into the producer from a hopper that is located over the top of the apparatus. The producer itself is a brick-lined chamber which sets in a water-seal through which the ash is removed. An opening is provided near the top for the discharge of the producer gas, which, as mentioned before, consists principally of carbon monoxide and hydrogen along with volatile matter, such as tar, soot, and also nitrogen. At the bottom of the producer there is an inlet for the introduction of air and steam. The mixture of the two passes upward through the fuel-bed, which is incandescent for a certain distance above the inlet. The coal is decomposed to form carbon monoxide and hydrogen, and a mixture of these gases passes through the green coal located above the incandescent coal, and distills off a certain proportion of the volatile matter contained in the coal, so that it mixes with the escaping gases.

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(Continued from page 614)

Real Competition on the Outside

We have real competition to face on the outside. The American mode of living is changing and undergoing a constant acceleration of pace. People eat less at home; they live differently; and a variety of reasons ranging from the war, prohibition and social unrest, the motor car and moving pictures, are advanced as having some influence, direct or indirect, upon our domestic business. I cannot bring myself to regard that as competition in the true sense. Rather, it seems to be the conflict of the changing times with our established methods. If we are an adaptable industry, it should not be difficult for us to adjust ourselves to the new order of things. We can apply gas service to the baking of 1,000,000 loaves of bread in one bakery instead of the baking of 1,000,000 individual loaves in 1,000,000 individual homes. If wholesale production is more efficient, perhaps some improvement will be found in our load factor or other advantages that attend the sale of large volume of gas.

If people are eating more and more of delicatessen and prepared foods, let us be alert to see to it that gas service cooks the food that the factories and delicatessens prepare. The laundries and the restaurants and all other service stations that are catering to the demands of humankind are all fish for our net. If we cannot combat human nature, at least we can keep pace with its changing modes.

Competition With Other Sources of Heat

The real competition that we face is the direct contest with other sources of heat. Over some of these we have the pronounced advantage of much greater convenience; over others, the equally important advantage of economy and lower costs, particularly where effectual and scientific schedule of rates make possible the demonstration of economies of which gas fuel is capable. But back of these, and in my opinion of even greater importance, there must be adequate salesmanship. That there is general recognition of that necessity is shown by the activities of the national associations of the various trades throughout the country and it is particularly demonstrated in these regional sales conferences. It is expressing no more than my personal opinion to say that while we need sales plans and systems and the devoted men and devoted effort of men expert in their execution, we need, also, and dominating our entire sales effort, a spirit of unalterable faith in the gas industry as it is now and as it will be in the future.

Conclusion

If I were to try to name the qualities that must predominate in the man upon whom has been placed the responsibility for the continued commercial development of the gas business, I should say—alertness, of course, resourcefulness, enthusiasm and energy. But above all of these, I would place the determination to succeed. My greatest faith would be placed in the last quality against all the paraphernalia and strategy and sales theory in science, although they are undeniably an important part in every commercial enterprise and essential allies of the sales executives. Neither sales manager or salesman is worthy of the name or the responsibility that goes with it unless his equipment includes an adequate share of what is sometimes defined by an inelegant word of four letters, which in more polite parlance means no more or less than faith and an unflinching determination to succeed.

The gas industry has placed its banner in the hands of those who are today the pioneers of the sellers of gas service, and theirs is the duty and the privilege of carrying that banner forward to its rightful place.

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THE NEW FORCE BEHIND GAS SALES

This is the title of a pamphlet published by the American Gas Association dealing with the Testing Laboratory in Cleveland. The pamphlet describes the laboratory and the methods that are used in testing appliances. It goes into detail on the preparation of standards and also shows how application for a test should be made. It describes the certificate of approval that is issued and is well illustrated with views of the laboratory and of the testing machinery therein.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

STUDY OF CALIFORNIA GAS INDUSTRY PROBLEMS

A STUDY of certain gas-making and fuel problems peculiar to the gas industry of California has been made by the Bureau of Mines, Department of Commerce, in co-operation with the California Gas Research Council.

The Bureau of Mines recommends that, in general, the following plan be followed in developing the gas industry in California to meet future conditions: Manufacture combined oil gas and carbureted water-gas, replacing the oil gas equipment by coal gas equipment as the price of oil advances, eventually making mixed coal gas and water gas, carbureting the latter to such an extent only as will be justified and determined by the relative prices of oil and coal and by the marketability of the coke. The seasonal peak load could be cared for by making oil gas, utilizing present oil gas generating equipment. In this manner the oil gas equipment need not be prematurely scrapped.

Unless a cheap means is discovered for removing the sulphur from high sulphur crude oil or from gas oils, it will be necessary to use oils containing a high per cent of sulphur in the manufacture of gas in California. In order to use such oil successfully, it will be necessary to provide means for purifying the resulting gas, which will contain a troublesome amount of hydrogen sulphide and organic sulphur. Whether the present process of liquid purification can be adapted to purify this gas, or a modified method developed, must be determined by research. An appreciable amount of the oil available in California—some of which is not being won at present—is high sulphur oil. Also much of the oil shale of California will yield oil high in sulphur, judging from the limited work done in this field of endeavor. The solution of the purification problem will simultaneously make available for gas making purposes the highest grade coal found in California, namely the Monterey county coal, which contains too much sulphur for this use under present conditions.

Detailed results of this survey are contained in Serial 2769, by William W. Odell, fuel engineer, copies of which may be obtained from the Bureau of Mines, Department of Commerce, Washington, D. C.

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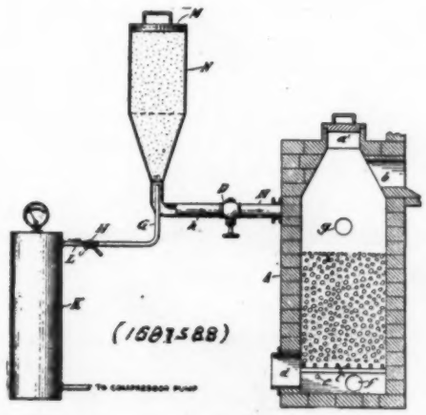
LOW-TEMPERATURE TAR

SEMI-COKE, gas, and low-temperature tar are obtained by heating solid fuel in a rotating retort, with a counter-current of the combustion gases obtained by burning waste coal, the gases being reduced to a temperature suitable for the production of low-temperature tar, by admixture with non-combustible gas, before entering the retort. (German Patent No. 417,688.)

MIXED WATER AND COAL GAS

MIXED coal and water gas is made in a generator having a fuel bed, which comprises subjecting the fuel bed to alternate air and steam blasting, injecting pulverized bituminous coal into the generator above the fuel bed as steam is being forced through the fuel bed from beneath. The



water gas arising from the fuel bed and resulting from the passage of the steam is enriched by the distillation of the pulverized fuel maintained in suspension by the upward current of water gas. The fuel bed is continually maintained at a substantially constant level by the down-falling carbonized residue of the pulverized coal. (U. S. patent No. 1,581,588.)

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PURIFYING COAL GAS

GASES are purified from hydrogen sulphide, hydrogen cyanide, carbon bisulphide and thiophene by passing them through a neutral solution of iron hydroxide in the presence of organic substances which prevent the precipitation of iron hydroxide, e.g., salicyclic acid, para hydroxybenzoic acid, phthalic acid and their salts, polyatomic alcohols and their derivatives, including the glycols and glycerine, citric acid and citrates. The solution is prepared by adding a 2 per cent solution of ferric sulphate to a 5 per cent solution of one of the above substances, neutralizing with soda ash and oxidizing by aeration with air. The solution is regenerated by aeration with air under pressure, sulphur being deposited and polythionic acids formed; the latter are accumulated in the liquid and ultimately recovered as thiosulphates. (British Patent No. 249,312.)

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

THANKSGIVING SALES

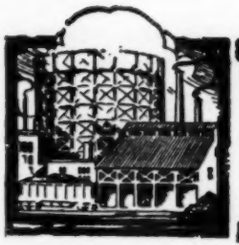
GAS men feel that with the coming of frost sales drop. This, however, is merely a state of mind. Sales may not be what is termed brisk during November, December and January, yet there is business to be had if we will just go after it. The Illinois Power and Light Corporation opened a special sale on the first of November to dispose of 1926 models of certain appliances on which a special price was made. For instance, the price on two lines of gas ranges were cut to the bone and so was the price of certain types of room heaters. This company kept this sale in force until the 15th of the month, when the customer was told of a special Thanksgiving sale. During the Thanksgiving sale the customer who purchases a gas range may have a ten-pound dressed turkey or a hot spot room heater free. The premium idea is a good one to employ in November.

Our Job at Thanksgiving Time
AGAIN the Thanksgiving Season—the time of year when we celebrate the old tradition of the Pilgrims. They had come safely thru all sorts of trials and difficulties and set aside a day on which they feasted and gave thanks for life and good cheer.
So we, too, give thanks that our country is prosperous, that we have the luxuries and conveniences of the day. And we celebrate it as a feast day.
The rousing odor of cooking food comes from the kitchen. Your thoughts are of the turkey, the gravy bubbling in the pan, the sweet potatoes browning in amber syrup, a big mince pie all sweet and spicy, baking in the oven. You're thinking of these things.
Did it ever occur to you that your Gas and Electric Company helps make it convenient for you to prepare the Thanksgiving Dinner? Whether it is a holiday or not some of us are always on the job to see that you have gas for cooking. Our work never stops.
The men at the gas works are thinking of you and the thousands of other people who are depending on them. For without gas, many a well planned dinner could not be cooked. And so they work day and night to fill and refill the giant gas holders to insure your comfort and pleasure. This is one of our jobs and we're proud of it, especially at Thanksgiving Time.
UTICA GAS & ELECTRIC CO.
Phone 4900
UTICA SERVICE

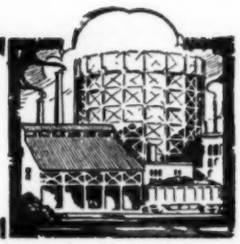
CHRISTMAS SALES

TO give a useful gift at Christmas time is the theme employed by many merchandisers for the past four or five years. The gas appliance merchandiser entered into the picture in a big way last year and no doubt will be stronger than ever this year. In the majority of cases the gas man advertised his complete line and from reports gathered from those who used this plan, sales were materially increased and the expenditure in exploiting complete lines of merchandise were amply justified by Christmas sales and sales after Christmas that were traceable to the Christmas advertising. The advertisements reproduced below will furnish an idea of how two of the larger gas companies handled Christmas gift copy. In all cases the gas man should tie his Christmas advertising into his store and window displays.

THANKSGIVING'S COMING—AND CHRISTMAS—WITH THEIR FEASTS TO BE PREPARED
In Grandmother's Day—AND NOW!
Surprise Mother NOW, While She Can Enjoy It, With That New
GAS RANGE
FREE
This week sells with each Gas or Electric Range sold by us, one
Kitchen Lighting Unit
We sold hundreds of these units last spring at a special value at $7.50 each.
DON'T WAIT TILL CHRISTMAS—GIVE IT NOW!
A new Gas Range in the kitchen will lighten very materially the labor in that vital department of your home.
Our Ranges (three standard makes to choose among) have all the latest improvements; insulated Ovens, retaining heat long after the gas is turned off; large hot burners, overtion ovens, convenient height, sanitary construction, easy to keep clean, and so forth.
Come in and select the one you want — and do it this week while you can get the Kitchen Lighting Unit free with your purchase.
Our prices are well within the reach of everyone. And our easy payment terms, adding a little extra item to your gas bill for a few months, make it possible to buy almost without feeling the difference.
RETAIL STORES:
ATLANTA
75 Marietta St.
DECATUR
136 Sycamore St.
Georgia Railway & Power Co.



NEWS OF THE GAS INDUSTRY



Pacific Coast Gas Association Meets in San Francisco

Chairman Reports Good Progress on Committee Organization

The first quartely conference of the Pacific Coast Gas Association for the year 1926-1927 was held in San Francisco on November 18. Parallel meetings of the Technical, Accounting and Public Relations Sections were held in the morning, and a Commercial Section meeting in the afternoon. A noon luncheon replaced the usual evening dinner in order to permit a number of those attending the conference to make an overnight trip to Marysville to inspect the newly completed water gas plant of the Pacific Gas and Electric Company.

The conference was especially important as the association is this year trying out a new plan of building up its committee organization. The chairmen of the four major sections were appointed by President Yard at the convention in August and instructed to prepare a program for the year, naming problems to be studied and describing the desired angle of attack. This program, which called for some 60 committees, was mailed to the association membership accompanied by a request for those interested to volunteer to serve. The response was very gratifying. The complete committee organization was determined upon at the conference and the subjects assigned were thoroughly discussed. It is believed that this procedure will tend to confine the committee work of the association to live and useful topics and greatly raise the standard of reports and papers.

F. W. Steere Addresses Meeting

Mr. Frank W. Steere of the Steere Engineering Company was in attendance at the Technical Section conference and took part in the discussion of the Marysville plant which is the first water gas plant to be operated in California for many years. At the Commercial conference, Mr. H. M. Crawford, sales manager of the Pacific Gas & Electric Company, suggested ways in which the Pacific coast could best co-operate with the Blue Star plan of the American Gas Association.

Section chairmen are E. N. Simmons, auditor, Los Angeles Gas and Electric Corporation, Accounting Section; C. M. Grow, sales manager, Southern California Gas Company, Commercial Section; D. L. Scott, director of public relations, Los Angeles Gas and Electric Corporation, Public Relations Section; and R. M. McCalley, superintendent of distribution, Portland Gas and Coke Company, Technical Section.

The luncheon period was devoted to entertainment guided by President Yard and R. E. Fisher who acted as master of ceremonies. Wiggington E. Creed, president of the Pacific Gas & Electric Company, made the principal address.

Equitable Gas Employees Elect Officers

Pittsburgh, Pa.—At a dinner dance given by the Equitable Gas Company Employees' Association in the Chamber of Commerce Building, the following officers were elected: President, L. L. Murray; vice-president, J. L. Hauser; treasurer, J. F. Dolan; women's affairs, Miss May Hill. Executive committee: General group, Paul Sallade; divison "A," J. M. Wachter; division "B," F. J. McKenna; division "C," M. J. Coulehan; division "E," Louis Auslander.

* * *

Alleghany Gas Co. Building Plant

Elkland, Pa.—The Alleghany Gas Company is building a plant at Roulette, which is to cost about $800,000 and will have a capacity of 1,000,000 cubic feet of water gas per day. This will be mixed with the natural product in accordance with the formula of the Public Service Commission of 800 British thermal units for the mixed product.

New England Industrial Men Hold First Meeting of Season

Use of Gas in the Non-Ferrous Metals Industry Discussed

R. J. Phelon, president of the Industrial Division, presided at this first meeting of the season held in Boston on November 12, 1926. He announced a tentative program, consisting of "House Insulation," for December 10th; "What the Gas Company Manager Expects of the Industrial Department," for March; and the subjects of "Refrigeration," "Process Steam" and "Cutting Torches," to be discussed at other meetings. He also announced that the annual meeting of the New England Gas Association would be held at the Hotel Bancroft, Worcester, Mass., on February 23-24, 1927.

An amendment to the constitution was offered, which would add to the clause of article three on requirements of membership, the following: "or such representatives of manufacturers, engaged in the manufacturing of equipment used in the industrial gas field." The constitution already makes all all those taking the gas course at M. I. T. eligible to membership as well as all gas company men en-

gaged in selling gas for industrial purposes. This amendment will make a manufacturer's representative who has not taken the gas course eligible in the same way that a gas company employee now is.

New Members Elected

The following new members were voted into membership at this meeting:

Stuart F. Morgan, industrial gas engineer, New Bedford Gas & Edison Light Co., New Bedford, Mass.

Laurence E. Wagner, chief industrial engineer, Providence Gas Co., Providence, R. I.

Alfred R. Burr, sales agent, New Haven Gas Light Co., New Haven, Conn.

Carl F. Sucher, New Haven Gas Light Co., New Haven, Conn.

Albert M. Barnes, president and general manager, Cambridge Gas Light Co., Cambridge, Mass.

Edward E. Bangs, industrial salesman, Lynn Gas & Electric Co., Lynn, Mass.

John Dowling, superintendent of power, The Conn. Power Co., New London, Conn.

Leon G. Swan, sales manager, Lawrence Gas & Electric Co., Lawrence, Mass.

Robert Lindsay, manager gas department, New Bedford Gas & Edison Light Co., New Bedford, Mass.

D. S. Reynolds, construction engineer, Boston Consolidated Gas Co., Boston, Mass.

Walter A. Oates, industrial salesman, Lynn Gas & Electric Co., Lynn, Mass.

Guy E. Stephens, new business manager, Worcester Gas Light Co., Worcester, Mass.

James R. Gibbins, house heating salesman, Worcester Gas Light Co., Worcester, Mass.

Raymond D. Morrison, industrial engineer, Central Maine Power Co., Augusta, Me.

Arthur C. Frey, engineer of manufacture, Worcester Gas Light Co., Worcester, Mass.

David M. McKay, superintendent of distribution, Bangor Gas Light Co., Bangor, Me.

Lester H. Knapp, industrial service engineer, Blackstone Valley Gas & Electric Co., Pawtucket, R. I.

Elisha S. Hudson, Boston Consolidated Gas Co., Boston, Mass.

Harry L. Barnes, commercial manager, Hartford City Gas Light Co., Hartford, Conn.

Howard R. Carlson, Hartford City Gas Light Co., Hartford, Conn.

Walter D. McCrea, industrial engineer, Cambridge Gas Light Co., Cambridge, Mass.

Ralph A. Arveson, foreman, Citizens Gas Light Co., Quincy, Mass.

The names of Carl A. Schegal, sales engineer, the U. G. I. Contracting Co., Philadelphia, Pa., and George D. Kingsland, N. E. branch manager, Minneapolis Heat Regulator Co., were held over for action until the amendment of the constitution is acted upon at the next meeting and manufacturer's representatives are made eligible to membership.

Mr. H. B. Smith urged that everyone become active in arranging to have gas talks given in their communities, stating that speakers are now available to give these talks.

The speaker, R. S. Wile of the Surface Combustion Co., was introduced by L. B. Crossman. Mr. Wile spoke on the subject of "Non-Ferrous Metals."

Petition for Gas Franchise

Brownsville, Tex.—Petition for a franchise to run a gas line into this city and supply residents with gas has been presented the city commission by the Valley Gas Company, which concern is now extending a line from the Webb county fields into the valley. The commission is expected to take up the matter in the near future, at which time a definite answer will be rendered.

* * *

Charles S. Hilton Elected President Gas Employees Club

Pawtucket, R. I.—Charles S. Hilton of the Pawtucket Gas Co., has been elected president of the Gas and Electric Club, a club of the employees of the Pawtucket Gas Co., and the Blackstone Valley Gas & Electric Company. This club has a membership of about 800 and its objects are social and educational.

Mr. Hilton is also president of the Oakhill Community Association, an association of residents of a newly developed and restricted residential section of Pawtucket in which Mr. Hilton lives in a newly erected gas heated house.

Public Utilities Advertising Association Appoints Committees

Committee appointments for the Public Utilities Advertising Association Session of 1926-1927 have been announced. These committees include the following gas men:

Association Bulletin Committee —Henry Obermeyer, Consolidated Gas Company, New York; J. McLaverty, superintendent advertising department, Consumers Gas Co., Toronto, Canada; H. F. Weeks, editor, American Gas Association, 342 Madison avenue, New York City.

Better Copy Committee—J. Chas. Jordan, Pacific Gas & Electric Co., San Francisco, Calif.; R. S. McCarty, The Philadelphia Company, Pittsburgh, Pa.; John F. Weedon, The Peoples Gas Light and Coke Co., Chicago, Ill.

Constitution and By-Laws Committee— Chairman, W. H. Hodge, Byllesby Engineering & Manufacturing Corp., Chicago, Ill.; E. Frank Gardiner, Midland Utilities Company, Chicago, Ill.; Dempster MacMurphy, Middle West Utilities Company, Chicago, Ill.

Convention Committee—Frank J. Jamison, Public Service Company of Colorado, Denver, Colorado.

Employment Committee—Chairman, Major T. J. Strickler, director, public relations, Gas Service Company, Kansas City, Mo.; John D. Clark, sales manager, Consolidated Gas Company, Boston, Mass.; Clyde H. Potter, advertising manager, Southern Counties Gas Company, Los Angeles, Calif.; R. H. Simmons, Kansas Gas & Electric Company, Wichita, Kansas.

Exhibits Committee—A. E. Holloway, superintendent commercial department, San Diego Consoli-

dated Gas and Electric Co., San Diego, Calif.

Membership Committee—Chairman, Vincent M. Carroll, Laclede Gas Light Company, St. Louis, Mo.; George A. Davis, Oklahoma Gas & Electric Company, Oklahoma City, Okla.; Thomas H. Parkinson, Logan Natural Gas Company, Columbus, Ohio.

Program Committee—Chairman, B. J. Mullaney, Peoples Gas Light & Coke Company, Chicago, Ill.; W. H. Hodge, Byllesby Engineering & Management Corp., Chicago, Ill.; Dempster MacMurphy, Middle West Utilities Co., Chicago, Ill.

Publicity Committee—Frank R. Barnitz, Consolidated Gas Company, New York City.; Janet MacRorie, Public Service Gas & Electric Co., Newark, N. J.

Speakers' Committee — Keith Clevenger, Empire Gas & Fuel Co., Bartlesville, Okla.; J. C. Jordan, Pacific Coast Gas & Electric Co., San Francisco., Calif.; Charles W. Person, American Gas Association, New York City.

Gas Industry Has Real Future

Year's First Meeting—Gas Sales Division of N. E. Gas Assn. Listen to Banker's View of Industry

The first meeting of the Sales Division of the New England Gas Association was held at the Boston City Club, Boston, Mass., on Friday evening, November 12th, 1926.

In calling the meeting to order the newly elected president, M. B. Webber expressed his appreciation on the large attendance, some two hundred members and guests being present.

A review of the contest for the Governor's Cups was outlined. The point was brought out that the companies who won the cups last year could not keep them permanently unless they were the winners each year. The gas companies were urged to enter the contest in an endeavor to stimulate sales of appliances.

F. C. Freeman Addresses Meeting

F. C. Freeman, president of the New England Gas Association, brought greetings to the members of the sales division. He was very optimistic about the future of the New England Gas Association. He said in part:

"The Gas Association are pleased and proud of the membership. At the present time the Association has 94 company members, 50 of these are New England gas companies and the 44 remaining are manufacturing companies making gas appliances. The operating division has 307 members, a gain of 12 since last winter; the sales division has 239 members, a gain of 35; the industrial division has 104 members a gain of 9, making the total membership in the New England Gas Association 650 or a total gain of 56 members."

Mr. Freeman also outlined to the members the plan of the new publication sponsored by the Gas Association. Regarding this publication, Mr. Freeman said:

Every Day Magazine

"The New England Gas Association has signed a contract for the publication monthly of a magazine which will be known as the "Every Day Magazine". This Magazine will not deal wholly with gas matters, it will have just enough gas reading in it to keep in the home of the public whom we serve continuously the gas man's voice.

"The various gas company members in New England will subscribe for as many copies of this magazine as they desire and they will either through the mail or some other system distribute these magazines to their customers monthly.

"To show you what the Providence Gas Company thinks of this plan, we started the ball rolling by taking 10,000 copies monthly for a year's time and we know and are positive that in a short space of time we will have subscriptions from the New England Gas Companies for at least 100,000 copies of this magazine to be distributed throughout New England.

"We will put over monthly the thought of gas in every home in a very interesting way. It will not be all gas; it will be a live magazine and continually attract the interest and hold the attention of our customers."

New England Gas News

"The New England Gas Association are going to issue monthly during the winter months a small publication which will start out in a small way. We are not sure just how much surplus we have at the present time. This publication will be called the New England Gas News. It will give a report of the meetings and items of news interest to members of the Association.

"The annual meeting of the new gas association will be held at the Hotel Bancroft in Worcester on February 23rd and 24th. All reservations should be made direct with the hotel."

Why the Gas Industry Has a Real Future

The speaker of the evening was Mr. William A. Hanway of the corporation department of Harris, Forbes & Company, New York City. Mr. Hanway brought a message to the members from the banking viewpoint of the gas industry. His speech was filled with enthusiasm about the future of the gas industry and he brought out the point very forcibly that banking houses were more than willing to recommend the securities of gas companies to their clients for investment because of the steady growth of the gas companies and the conservative manner in which they are operated.

At the conclusion of Mr. Hanway's address he was greeted with a vigorous round of applause and several of the members of the Association voiced their ideas and suggestions on how to increase the gas business in New England.

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George M. Kirchmer Elected By Self Insurers

Brooklyn, N. Y.—George M. Kirchmer, general claim agent of The Brooklyn Union Gas Company System, has been elected a member of the executive committee of the Self Insurers Association of the State of New York.

Mr. Kirchmer has been a member of the board of managers.

FALL RIVER CO. HAS COOKING CLASSES

Miss Marion E. Stark, Home Service Department, to Give Two Courses

Fall River, Mass.—Miss Marion Elizabeth Stark, who recently returned from her honeymoon, will personally conduct all the classes this fall. All the recipes that will be given have been made up by her.

It happens that two different kinds of cooking courses are given. In the first free course of five cooking lessons, similar in some respects to the first course given last year, Miss Stark will cover the essential practices in modern cooking and will offer many new recipes that are delicious to serve but very economical to make. Over 1300 women in Fall River have already taken advantage of the free instruction in cooking given by Miss Stark, who is a graduate of Simmons college and who formerly taught in Miss Farmer's School of Cookery, Boston, before coming to take charge of the home service work of the local gas company. About 100 may attend the first course, and only those who have never yet attended any of Miss Stark's classes.

* * *

Doherty Girls Sorority Formed in Joplin

Joplin, Mo.—A Doherty Girls sorority, composed of women employees of the Gas Service Company, and the local branch, the Joplin Gas Company, was organized at a meeting at the home of F. T. Parks, district manager for the Gas Service Company.

Hazel Key was elected president, Elsie Vachtold, vice president, and Vola Read, secretary-treasurer. The sorority will begin a study course, relative to history and methods of the gas business, and also will hold occasional social functions.

The sorority is not connected with the Doherty Girls' Club, composed of women employees of the Empire District Electric Company. Both companies are subsidiaries of the Henry L. Doherty Company.

Utica G. & E. Merger at Albany

Albany.—Certificates have been filed in the office of the secretary of state merging Newport Electric Light and Power Company and Central New York Power Company with the Utica Gas and Electric Company.

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Newtown Gas Co. Entertains Customers

Brooklyn, N. Y.—The customers of the Newtown Gas Company were the guests of the company at a reception which was held during the week beginning November 1 and ending Saturday evening, November 6. The occasion was the dedication of the new building at the corner of Grand Street and Queens Boulevard. An orchestral concert was given each afternoon from 1 until 5 o'clock.

The structure has been recently built and is the last word in a public service building. Located in the building is a large auditorium for the holding of meetings. There is also a model kitchen, thoroughly equipped with all appliances for the use of gas in the home. Another portion of the building is fixed for display for industrial appliances and for the heating of homes.

At the reception, expert demonstrators in the use of gas appliances were on all floors of the building to show the public the use of the various appliances.

The auditorium and model kitchen were in charge of the young women of the Home Service Division of the gas company. Miss Ruth Soule, who has had wonderful experience as a lecturer in the art art of cookery, gave lectures during the week and was assisted by Miss Martha Louise Grant, Miss Mildred Magonigle and Miss Margaret Conklin, all experienced in the Home Service demonstration. They received the guests and entertained them. These young women have been lecturing in Queens Borough for the past year on Home Service Economics and have made many friends.

ROCHESTER GAS AND COKE SALES GROWING, REPORTS SHOW

First Ten Months of 1926 Show Increase Over Those of 1925

Rochester, N. Y.—Increased use of gas and gas coke is shown in the monthly reports of heads of two departments of the Rochester Gas and Electric Corporation. Gas sales in the first ten months of this year showed a 12.33 per cent gain over those of a like period in 1925, while coke deliveries for the same months showed a 40 per cent increase in favor of this year. The month of October was marked by the largest tonnage delivery of coke in the history of the corporation, it was declared.

In the first ten months of this year 3,277,679,500 cubic feet of gas were manufactured and sold, Joseph P. Haftenkamp, superintendent of the gas department, announced. The first ten months of 1925 showed sales amounting to 2,917,778,000 cubic feet. Last month the sales amounted to 362,011,700 cubic feet, an increase of 12.8 per cent over those for October, 1925, when 320,926,400 cubic feet were sold.

Coke deliveries last month were recorded at 13,966 tons, which has been approximated only by last April, when deliveries were recorded at 12,669 tons. In October, 1925, the company delivered 12,506 tons of coke.

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Alabama Power Co. Improves Albany Gas Plant

Albany, Ga.—Improvements in the gas plant of the Alabama Power Company here are well under way and are expected to be completed by the first of the year.

The improvements, which will cost in the neighborhood of $40,000 when finished, include a new gas holder of the latest and most approved type; new machinery and an extension of the gas mains to increase the service now given by the plant.

The new equipment will add very materially to the output of the plant and provide a larger supply of gas for customers.

PAVILION CO. BEGINS CONSTRUCTION ON NEW GAS PLANT

Robert I. Thompson Appointed General Manager of New Company

Perry, N. Y.—The Pavilion Gas Company is now engaged in the construction of a manufacturing gas plant at their property in Pavilion. This plant will be capable of producing about 1,000,000 cubic feet of gas per day, and it is hoped that the plant will be ready for operation some time in January, 1927, at which time the various towns served by the company will be assured of an ample supply of gas at all times. The date of completion of the plant will, of course, depend on the kind of weather which will be experienced from now on. At the present time, forces are engaged in placing foundations for the gas holder and buildings, etc. The gas holder will be of 200,000 cubic foot capacity. Gas holders of the pressure type will also be placed in the various towns, which will receive the gas from the plant at Pavilion and distribute it to the consumers.

Robert I. Thompson has been appointed general manager of the Pavilion Company, New York State Natural Gas Company and Churchville Natural Gas & Oil Company, with headquarters at Pavilion. He is an experienced gas man, having operated plants at Raleigh, N. C., Durham, N. C., Danbury, Conn., and Newburgh, N. Y.

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Gas Service Company Officials Meet in Joplin

Joplin, Mo.—A meeting was recently held here for eighteen managers of branches of the Gas Service Company in the Tri-State district. F. T. Parks, district manager, presided, and Fred Karr, of Kansas City, public relations director, was one of the speakers.

The managers represent a territory which extends west to Nowata, Okla., and includes practically all of northeast Oklahoma, southeast Kansas and southwest Missouri.

Others present included the following company managers: John Crout, Gas Service Company, Kansas City; H. W. Brown, Beggs Gas Company, Beggs, Okla.; N. W. Carpenter, Tri-City Gas Company, Chelsea, Okla.; R. C. Dillinger, Tri-City Gas Company, Cherryvale, Kan.; C. F. Drake, Consumers Gas Company, Miami, Okla.; Charles Jenkins, Tri-City Gas Company, Altoona, Kan.; J. W. King, Ottawa Gas and Electric Company, Ottawa, Kan.; M. A. McHenry, Pittsburg Gas Company, Pittsburg, Kan.; Carl Mouch, Miami County Pipeline Company, Paola, Kan.; W. B. Ossenbeck, Wellsville Gas Company, Wellsville, Kan.; E. C. Pfenning, Parsons Gas Company, Parsons, Kan.; L. H. Siebenthaler, Nowata County Gas Company, Nowata, Okla.; J. P. Simson, Dewey Gas Company, Dewey, Okla.; Herbert Stockwell, Miami County Gas Company, Paola, Kan.; Fred Tawney, Miami County Gas Company, Osawatomie, Kan.; N. D. Wade, Consumers Gas Company, Chetopa, Kan.; A. C. Porter, Carthage Gas Company, Carthage; George York, Webb City and Carterville Gas Company, Webb City, and T. B. Wood, superintendent, Joplin Gas Company, Joplin.

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Dayton Holds Gas Show—Many Features Analyzed

Dayton, O.—Dayton's first gas exposition was recently held at Memorial hall under the auspices of the Dayton Power and Light Co.

Not the least of the many special features was the illuminating of not only the interior of the exposition, but the outside of the building and grounds. Many people had an opportunity of seeing for the first time some of the effects that are being used at the sesqui-centennial at Philadelphia in the way of color lighting with steam clouds. The interior of the entire hall was treated in a novel manner. All of the special lighting was arranged by the company's illuminating engineer, H. S. Nonneman, and his assistants.

Owing to the demand for space from the various manufacturers the entire lower floor of the hall had to be used. Every foot of available space was used. A room was devoted to a group display of the local plumbers' association. The company's own departmental displays occupied still another room. And the model basement, which attracted the attention of everyone, was installed in the old boiler room, which has given way to the march of progress.

Music was provided by the Miami hotel orchestra. A unique prize contest was also announced. Prizes including a Universal gas range, Pittsburgh water heater, Ray-Glo radiant heater and a Brilliant radiant heater were included in the group to be awarded to the lucky person.

This exposition attracted statewide attention. Many of the exhibits were shipped direct to Dayton from the recent American Gas Exposition held at Atlantic City last month.

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G. H. Waring Secures Argentina Franchise

Grand Rapids, Mich.—George H. Waring, consulting engineer of Grand Rapids, Michigan, has just received a cable stating that his application for a gas franchise at Rosario, Argentina, a city of 300,000 population, has been accepted by the municipality for the contruction and operation of a gas plant and distribution system in that city. Mr. Waring sails November 20th from Hoboken for Buenos Aires on the S.S. "Southern Cross."

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Long Gas Line to Be Laid

San Antonio, Tex.—One of the largest long distance gas trunk lines in the world, stretching from the Texas Panhandle to Kansas City and serving a vast section of the Middle West, will be laid by a new $25,000,000 corporation financed by Eastern and mid-Western capital, according to a report made recently.

The main line from Kansas City is to be a twenty-inch one with large laterals branching off on either side, supplying natural gas to a number of communities over an extensive territory. The corporation undertaking the project consists of the Emerald Oil Company of Winfield, Kan., and other associated interests.

Contracts Awarded

The Consolidated Gas Company of New York City has placed order with The Gas Machinery Company of Cleveland, Ohio, for fifty-four sets of Breeze and Dust Collectors to be installed on stacks of water gas apparatus in the various stations of the gas company.

The Breeze and Dust Collectors are provided with a head which is placed over the stack, and which collects the breeze and dust, conducting it through suitable pipe to a receiver having a gravity discharge gate to deliver the breeze and dust into suitable cars or ducts.

The abatement of the breeze and dust nuisance in the neighborhood eliminates complaints of authorities and maintains a cleaner yard, cleaner roofs, cleaner holder cups, and also saves the breeze which is burned under the boilers, or otherwise suitably used.

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OLDEST LIGHTING FIXTURES FIRM REORGANIZES

E. P. Gleason Mfg. Co. of New York to Incorporate

Following the death of the late Elias Whitney, for the past 22 years proprietor of E. P. Gleason Mfg. Co., 37-39 Murray street, New York, the business has been completely reorganized and incorporated. The new firm will be known as E. P. Gleason Mfg. Co., Incorporated.

E. P. Gleason Mfg. Co. was one of the first American business houses to introduce lighting fixtures with the advent of artificial gas, and is today probably the oldest in the field. It is one of the few original lighting fixture firms still doing business today. It was established by E. P. Gleason in 1851, at 135 Mercer street, New York.

This pioneer firm was built around the development of the gas burner, and sponsored the Argand, the most successful gas burner of that period. Mr. Gleason remained in continuous control of the company for fifty years, until his death in 1901. As the business expanded it was removed to larger quarters at 20 West Houston street in 1873 and 1904 to its present address at 37-39 Murray street.

New Officers

The officers of the new corporation are George E. Mallinson, president; Perry Gleason, vice-president; Harold C. Albertson, treasurer and general manager, and William G. Sherrer, secretary. Both Mr. Perry Gleason and Mr. Sherrer are well known in the trade and have been associated with E. P. Gleason Mfg. Co. for more than 25 years.

The new management will continue the business along the same general lines, offering a complete line of residential and commercial lighting fixtures and novelties. A new commercial unit, the "Gleasonlite" with several patented features and in a variety of styles and finishes, will be placed on the market in the near future.

The showrooms are being completely renovated and remodeled. A new catalog is in course of preparation and will be issued about December 1st.

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A NEW GAS INCINERATOR

Indicated for Hospitals, Restaurants, Apartments, Etc.

The Home Incinerator Co., Milwaukee, Wis., has just perfected a nine bushel capacity, gas-fired incinerator or complete disposal

plant in which all table waste and all forms of rubbish may be deposited. When nine bushels have accumulated, the contents are burned to a pure, white ash conveniently, noiselessly and most economically.

It is no longer necessary for restaurants, hospitals, apartments, clubs, etc., to be bothered with the nuisance of garbage cans.

A cross section view of the incinerator is shown. It is 40 inches long, 28 inches wide and 30 inches high.

The Construction Features

Its construction consists of:

Outer shell: sheet iron, lining, cast iron, corrugated to allow free air to come in contact with burning materials at all times. Air space of one inch between outer shell and inner lining.

Cover: cast iron, counterbalanced. Cover 22 inches by 22 inches. Made large to permit the depositing of large quantities of waste material at one time.

Agitation lever: a special feature which permits the loosening of the material after shrinkage has taken place.

Burners: two in number. Drilled pipe type may be operated individually or together.

Grates: saw-tooth arrangement, giving considerable grate area, a special feature in the machine.

Dumping grates: two in number. Operated separately, on either side of the incinerator.

Vent pipe: ten inches.

Shipping weight: 1200 pounds.

The trade name is "The Incino." Literature describing same in detail will be sent on request by addressing the above firm.

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New Britain Gas Light Co. Vote Capital Increase

New Britain, Conn.— At the regular meeting of the directors of the New Britain Gas Light Co., it was recommended to the stockholders that the capital stock be increased from $1,000,000 to $1,250,000. A special meeting of the stockholders was called for November 9 for this purpose.

Should the stockholders confirm the action of the directors, the money for the new stock will be called for some time during the month of January and will be used to increase the manufacturing capacity at the gas works and to pay for pipe line from the gas works to the north end of the town. The rapid growth of the outlying sections of the city makes necessary this addition.

The usual dividend of 2 per cent payable November 1 to stock of record October 26th, was voted.